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SEARCH REQUEST FORM

Scientific and Technical Information Center

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If more than one search is submitted, please prioritize searches in order of need.

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Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: _____

Inventors (please provide full names): _____

_____

Earliest Priority Filing Date: _____

***For Sequence Searches Only* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.**

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L75 ANSWER 1 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 2001:620538 HCAPLUS
DN 135:354803
TI Evaluation of osmium(II) complexes as electron transfer mediators accessible for **amperometric** glucose sensors
AU Nakabayashi, Yasuo; Omayu, Atsushi; Yagi, Shiro; Nakamura, Kazuyo; Motonaka, Junko
CS Unit of Chemistry, Faculty of Engineering, Kansai University, Suita, 564-8680, Japan
SO Anal. Sci. (2001), 17(8), 945-950
CODEN: ANSCEN; ISSN: 0910-6340
PB Japan Society for Analytical Chemistry
DT Journal
LA English
AB In order to lower the **redox** potentials of Os(III/II) complexes, the mixed ligand complexes of Os(II) were synthesized. The **redox** potentials of Os(III/II) complexes could be lowered by the use of 4,4'-dimethyl-2,2'-bipyridine (dmbpy), imidazole (Him) or its derivs., and chloride ion as ligands, e.g., values of the **redox** (formal) potentials of 628 mV vs. **Ag/AgCl** for [Os(bpy)3]3+/2+ (bpy: 2,2'-bipyridine) and -6 mV for [OsCl(Him)(dmbpy)2]2+/+ were given in deaerated 0.1 mol dm-3 phosphate buffer (**pH** 7.0). The evaluation of Os(II) complexes as electron transfer mediators accessible for **amperometric** glucose sensors was examd. according to the detn. of the **redox** potentials of Os(III/II) complexes and the second-order rate consts. for electron transfer between **glucose oxidase** (GOx) in reduced form and the Os(III) complex. Although the Os(II) complexes with lower **redox** potentials tended to decrease the second-order rate consts. ks, the ks values for the majority of Os(II) complexes synthesized in this study were greater than that for ferrocenecarboxylic acid. Acceleration of the electron-transfer reaction

is attributable to the hydrogen bonding and/or the electrostatic interaction between the Os(II) complexes and GOx. It may be consequently concluded that the mixed ligand complexes of Os(II) with bpy (dmbpy), Him (its derivs.), and Cl- can act as more efficient electron transfer mediators for the fabrication of **amperometric** glucose sensors.

IT **9001-37-0**, **Glucose oxidase**
RL: ARG (Analytical reagent use); PEP (Physical, engineering or chemical process); ANST (Analytical study); PROC (Process); USES (Uses)
(osmium(II) complexes as electron transfer mediators accessible for **amperometric** glucose sensors)

RE.CNT 33
RE
(1) Beh, S; Analyst 1991, V116, P459 HCAPLUS
(2) Cass, A; Anal Chem 1984, V56, P667 HCAPLUS
(5) Foulds, N; Anal Chem 1988, V60, P2473 HCAPLUS
(6) Garguilo, M; Anal Chem 1993, V65, P523 HCAPLUS
(7) Green, M; Anal Proc 1991, V28, P374 HCAPLUS
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L75 ANSWER 2 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 2001:447170 HCAPLUS
DN 135:204468
TI An **amperometric** biosensor for hydrogen peroxide based on the co-immobilization of catalase and **methylene blue** in an Al2O3 sol-gel modified **electrode**
AU Chen, Dandan; Liu, Baohong; Liu, Zhengjiu; Kong, Jilie
CS Department of Chemistry, Fudan University, Shanghai, 200433, Peop. Rep. China
SO Anal. Lett. (2001), 34(5), 687-699
CODEN: ANALBP; ISSN: 0003-2719
PB Marcel Dekker, Inc.
DT Journal
LA English
AB A novel biosensor for the **amperometric** detection of H2O2 was developed based on the co-immobilization of catalase and **methylene blue** on an Al2O3 sol-gel fabricated glassy C **electrode**. The membrane structure of the sol-gel-immobilized catalase and **methylene blue** was studied with SEM. Cyclic voltammetric and **amperometric** measurements demonstrated that **methylene blue** co-immobilized with catalase in this way displayed good stability and efficiently shuttled electron between the immobilized **enzyme** and the **electrode**. Electrocatalytic redn. of H2O2 at the **electrode** was evaluated with respect to soln. **pH**, operating potential and selectivity. The biosensor was stable at least for 3 wk.

IT **61-73-4**, **Methylene blue**
RL: ARU (Analytical role, unclassified); DEV (Device component use); ANST (Analytical study); USES (Uses)
(an **amperometric** biosensor for hydrogen peroxide based on the co-immobilization of catalase and **methylene blue** in an Al2O3 sol-gel modified **electrode**)

RE.CNT 33
RE
(1) Aizawa, M; Anal Lett 1984, V17(B7), P555 HCAPLUS
(3) Avnir, D; Acc Chem Res 1995, V28(8), P328 HCAPLUS
(4) Bifulco, L; Anal Lett 1994, V27(8), P1443 HCAPLUS
(6) Chen, L; Anal Lett 1991, V24(1), P1 HCAPLUS
(7) Danner, D; Arch Biochem Biophys 1973, V156(2), P759 HCAPLUS
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L75 ANSWER 3 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 2001:405504 HCAPLUS
DN 135:57972
TI Urea **biosensor** based on **amperometric pH-sensing** with **hematein** as a **pH-sensitive redox** mediator

AU **Pizzariello, A.; Stredansky, M.; Stredanska, S.; Miertus, S.**
CS Area Science Park, POLYtech, Trieste, 34122, Italy
SO Talanta (2001), 54(4), 763-772
CODEN: TLNTA2; ISSN: 0039-9140
PB Elsevier Science B.V.
DT Journal
LA English
AB The natural dye **hematein** in water soln. was used as a **pH -sensitive redox**-active mediator for **amperometric pH-sensing**. The electrochem. characteristics were studied using cyclic voltammetry and chronoamperometry. Several types of urea **biosensors** were constructed with **urease** on the surface of **platinum** and graphite composite **electrodes** or in the bulk of the graphite composite. They were used for the **amperometric** urea detn. at a working potential of 0 mV (vs. SCE) using 0.5 mM **hematein**. Detection limits and response linearity was in the micromolar range depending on the **biosensor** type, concn. and **pH** of buffers used. An interference study of various cations, anions, and substances, which may be present in real samples demonstrated good selectivity for the detn. of urea. The **biosensors** showed good operational (>3 h) and storage (>3 mo) stability. The results of urea detn. in blood and urine obtained by **biosensor** correlated well with those obtained by a spectrophotometric ref. method.
IT **9002-13-5, Urease**
RL: ARG (Analytical reagent use); PEP (Physical, engineering or chemical process); ANST (Analytical study); PROC (Process); USES (Uses)
(urea **biosensor** based on **amperometric pH-sensing** with **hematein** as a **pH-sensitive redox** mediator)
IT **475-25-2, Hematein**
RL: ARU (Analytical role, unclassified); ANST (Analytical study)
(urea **biosensor** based on **amperometric pH-sensing** with **hematein** as a **pH-sensitive redox** mediator)
IT **7440-06-4, Platinum**, uses
RL: DEV (Device component use); USES (Uses)
(urea **biosensor** based on **amperometric pH-sensing** with **hematein** as a **pH-sensitive redox** mediator)
RE.CNT 40
RE
(1) Adeloju, S; Anal Chim Acta 1993, V281, P621 HCAPLUS
(2) Adeloju, S; Anal Chim Acta 1996, V323, P107 HCAPLUS
(3) Aggarwal, K; J Chem Ecol 1999, V25, P2327 HCAPLUS
(5) Amine, A; Bioelectrochem Bioenerg 1992, V28, P117 HCAPLUS
(6) Bertocchi, P; Biosens Bioelectron 1996, V11, P1 HCAPLUS
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L75 ANSWER 4 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 2001:391065 HCAPLUS
DN 135:210033
TI A solid binding matrix/molecularly imprinted polymer-based **sensor** system for the determination of clenbuterol in bovine liver using differential-pulse voltammetry
AU **Pizzariello, Andrea; Stred'ansky, Miroslav; Stred'anska, Silvia; Miertus, Stanislav**
CS POLYtech S.C.r.l., Trieste, 34012, Italy
SO Sens. Actuators, B (2001), B76(1-3), 286-294
CODEN: SABCEB; ISSN: 0925-4005
PB Elsevier Science B.V.
DT Journal
LA English
AB A selective and sensitive method has been developed for the detn. of clenbuterol in bovine liver samples using differential-pulse voltammetry

(DPV), based on the electrochem. behavior of clenbuterol at a molecularly imprinted polymer (MIP)-modified solid binding matrix composite electrode (SBMCE). The method of clenbuterol detection involves two steps. In the first step, clenbuterol binds selectively to the MIP. In the second step, an electroinactive competitor (isoxsuprine) is added in excess, whence some of the bound clenbuterol is released. The released clenbuterol is analyzed using DPV. The electrode renewal was achieved by a simple mech. polishing step of the SBMCE surface. The detn. of clenbuterol in bovine liver fortified with increasing concns. of this drug is also described, involving liq.-liq. extn. followed by a mixed-mode solid-phase extn. procedure. The integrated MIP-SBMCE displays good mech. properties, electrochem. performances and can be a very useful tool in monitoring the use of anabolics in meat prodn.

RE.CNT 57

RE

(1) Andersson, L; J Chromatogr 1990, V516, P323 HCAPLUS
(2) Andersson, L; Makromol Chem Rapid Commun 1989, V10, P491 HCAPLUS
(3) Ayotte, C; J Toxicol Toxin Rev 1999, V18, P113 HCAPLUS
(4) Bazylak, G; Chirality 1999, V11, P387 HCAPLUS
(6) Blass, A; J Vet Pharmacol Therap 1999, V22, P234 HCAPLUS

ALL CITATIONS AVAILABLE IN THE RE FORMAT

L75 ANSWER 5 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 2000:697714 HCAPLUS
DN 134:68195
TI Selective and Sensitive **Biosensor** for Theophylline Based on Xanthine Oxidase Electrode
AU **Stredansky, Miroslav; Pizzariello, Andrea; Miertus, Stanislav**; Svorc, Jozef
CS Area Science Park, Polytech, Trieste, I-34012, Italy
SO Anal. Biochem. (2000), 285(2), 225-229
CODEN: ANBCA2; ISSN: 0003-2697
PB Academic Press
DT Journal
LA English
AB Milk and microbial xanthine oxidases (XOs) were used for the construction of amperometric enzyme electrodes. Substrate specificity differences of these enzymes were studied. Of the two enzymes, only the microbial XO was found to oxidize theophylline, but not theobromine and caffeine. The substrate specificity of microbial XO was affected by pH, where the optimum for xanthine was 5.5, while for theophylline it was in the range from 6.5 to 8.5. The theophylline **biosensor** showed a low detection limit of 2.times.10-7 M and signal linearity up to 5.times.10-5 M. The sensitivity of the microbial XO electrode to theophylline could be selectively eliminated by immersion in alk. phosphate soln., thus allowing for the construction of a blank electrode for differential measurements. The feasibility of this approach has been demonstrated by the detn. of free (unbound) and total theophylline in blood samples. The **biosensor** exhibited good operational (>6 h) and shelf (>3 mo) stability when trehalose was used as a stabilizer of the biocatalytic layer. (c) 2000 Academic Press.

RE.CNT 24

RE

(1) Cavalheiro, E; J Pharm Biomed Anal 1999, V19, P217 HCAPLUS
(2) Cayuela, G; Analyst 1998, V123, P371 HCAPLUS
(3) Foulds, N; Anal Chim Acta 1990, V229, P57 HCAPLUS
(4) Groom, C; Anal Biochem 1995, V231, P393 HCAPLUS
(6) Harris, C; J Biol Chem 1997, V272, P22514 HCAPLUS

ALL CITATIONS AVAILABLE IN THE RE FORMAT

L75 ANSWER 6 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 2000:553725 HCAPLUS
DN 133:132098
TI **pH-sensitive amperometric biosensor**
IN **Pizzariello, Andrea; Stredansky, Miroslav; Stredanska, Silvia; Miertus, Stanislav**

PA **Saicom S.r.l., Italy**
SO PCT Int. Appl., 36 pp.
CODEN: PIXXD2
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2000046393	A1	20000810	WO 2000-EP455	20000121
	W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
	RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
	EP 1151134	A1	20011107	EP 2000-903603	20000121
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
PRAI	IT 1999-MI210	A	19990204		
	WO 2000-EP455	W	20000121		

AB The present invention describes a new electrochem. **biosensor** comprising (i) a **biocatalyst** producing a **pH** change when interacting with the analyte to be detd. and (ii) a compd. exhibiting different **redox** properties both in its protonated and non-protonated forms (**pH-sensitive redox** compd.). The elements described above are integrated in a **biosensor** system composed of a working **electrode** and a ref. **electrode** connected to an ammeter. When the analyte is present, the system produces a current change that is proportional to the concn. of the analyte. The **biosensors** described herein can be used in the accurate detection of a wide range of analytes. They can be used in diagnostics, industrial processes, food and feed quality control, biotechnol., pharmaceutical industry, environmental monitoring and so on.

IT **7440-44-0, Glassy carbon**, uses
RL: DEV (Device component use); USES (Uses)
(glassy; **pH-sensitive amperometric biosensor**)

IT **61-73-4, Methylene blue 95-54-5D**, o-**Phenylenediamine**, polymd. **106-50-3**, P-**Phenylenediamine**, uses **117-39-5, Quercitin 149-91-7D**, Gallic acid, alkyl **475-25-2, Hematein 517-28-2, Hematoxylin 9000-95-7, Apyrase 9001-03-0, Carbonic anhydrase 9001-37-0, Glucose oxidase 9002-13-5, Urease 9013-05-2, Phosphatase 9013-79-0, Esterase 9024-98-0, Oxalacetate decarboxylase 9027-22-9, Decarboxylase 9027-41-2, Hydrolase 9031-56-5, Ligase 9035-74-9, Phosphorylase 9047-61-4, Transferase 9055-04-3, Lyase 9055-15-6, Oxidoreductase 9067-84-9, Deaminase 9073-60-3, Penicillinase**
RL: ARG (Analytical reagent use); ANST (Analytical study); USES (Uses)
(**pH-sensitive amperometric biosensor**)

IT **7439-97-6, Mercury**, uses **7440-06-4, Platinum**, uses **7440-22-4, Silver**, uses **7440-57-5, Gold**, uses **7783-90-6, Silver chloride (AgCl)**, uses **10112-91-1, Calomel**
RL: DEV (Device component use); USES (Uses)
(**pH-sensitive amperometric**

biosensor)
RE.CNT 8
RE
(1) Genetics Int Inc; EP 0125139 A 1984 HCAPLUS
(2) Gorton, L; ANAL CHIMICA ACTA 1991, V249, P43 HCAPLUS
(3) Kulys, J; ANAL CHIMICA ACTA 1994, V288, P193 HCAPLUS
(5) Optical Systems Dev Partners; WO 9116630 A 1991 HCAPLUS
(6) Qian, J; ANAL BIOCHEM 1996, V236(2), P208 HCAPLUS
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L75 ANSWER 7 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 2000:487726 HCAPLUS
DN 133:249202
TI **Biosensors** with **amperometric** detection of **enzymatically** controlled **pH**-changes
AU Bardea, Amos; Katz, Eugenii; Willner, Itamar
CS Institute of Chemistry, The Hebrew University of Jerusalem, Jerusalem, 91904, Israel
SO Electroanalysis (2000), 12(10), 731-735
CODEN: ELANEU; ISSN: 1040-0397
PB Wiley-VCH Verlag GmbH
DT Journal
LA English
AB New **biosensors** based on **amperometric** detection of **enzymically** controlled **pH**-changes are described. Pyrroloquinoline quinone (PQQ) is assembled as a monolayer onto a **Au-electrode**, and .alpha.-chymotrypsin or **urease** is covalently linked to the PQQ-monolayer **electrode**. **Biocatalyzed** hydrolysis of N-acetyl-4-tyrosine Et ester by .alpha.-chymotrypsin or **biocatalyzed** degrdn. of urea by **urease** alters the **pH** of the electrolyte soln. The changes in the **pH** are sensed by the **redox**-potential of the PQQ-**redox**-active units assocd. with the **electrode**. Tethering of electroactive **pH**-insensitive, ferrocene units to the protein enables the sensing of the **pH** variations by following the p.d. between PQQ and ferrocene electroactive units. This enables the use of the integrated PQQ-ferrocene-tethered **enzyme electrode** as a **pH**-controlled biosensor with an internal potential ref.
IT **9002-13-5, Urease**
RL: ARU (Analytical role, unclassified); BAC (Biological activity or effector, except adverse); BPR (Biological process); ANST (Analytical study); BIOL (Biological study); PROC (Process)
(**biosensors** with **amperometric** detection of **enzymically** controlled **pH**-changes)
RE.CNT 27
RE
(3) Guilbault, G; Anal Chem 1973, V45, P417 HCAPLUS
(4) Guilbault, G; Anal Chim Acta 1970, V52, P287 HCAPLUS
(5) Heleg-Shabtai, V; J Am Chem Soc 1997, V119, P8121 HCAPLUS
(6) Heller, A; J Phys Chem 1992, V96, P3579 HCAPLUS
(7) Jin, W; Biosens Bioelectron 1995, V10, P823 HCAPLUS
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L75 ANSWER 8 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 2000:320977 HCAPLUS
DN 133:147144
TI **Amperometric pH-sensing biosensors** for urea, penicillin, and oxalacetate
AU **Stred'ansky, M.; Pizzariello, A.; Stred'anska, S.; Miertus, S.**
CS POLYtech, Trieste, 34012, Italy
SO Anal. Chim. Acta (2000), 415(1-2), 151-157
CODEN: ACACAM; ISSN: 0003-2670
PB Elsevier Science B.V.
DT Journal

LA English
AB The possibility of constructing a **biosensor** exploiting **amperometric pH-sensing** was investigated. The principle is based on the use of **pH-sensitive redox**-active probe mols. The selected probe mols. applied in various forms, e.g. dissolved **hematein, electrode** bulk lauryl gallate, adsorbed **methylene blue** poly(o-**phenylenediamine**) film, were used for the construction of penicillin (with **penicillinase**), urea (with **urease**), and oxalacetate (with **oxalacetate decarboxylase**) **biosensors. Platinum, gold** and solid composite **electrodes** were used as transducers. The **biosensors** exhibited low detection limits, from 2 to 10 .mu.M, linear responses up to 2 mM, insensitivity to a small variation in the ion concns., a good accuracy and storage stability. The present, new concept could extend the range of analytes detectable using the **amperometric** transduction technol., such as substrates of **decarboxylases**, amidohydrolases, **esterases** and other **hydrolases.**
IT **9002-13-5, Urease 9024-98-0, Oxalacetate decarboxylase 9073-60-3, Penicillinase**
RL: ARU (Analytical role, unclassified); BAC (Biological activity or effector, except adverse); BPR (Biological process); DEV (Device component use); ANST (Analytical study); BIOL (Biological study); PROC (Process); USES (Uses)
(**amperometric pH-sensing biosensors** for urea, penicillin, and oxalacetate)
IT **61-73-4, Methylene blue 475-25-2, Hematein**
RL: ARU (Analytical role, unclassified); DEV (Device component use); ANST (Analytical study); USES (Uses)
(**amperometric pH-sensing biosensors** for urea, penicillin, and oxalacetate)
RE.CNT 32
RE
(3) Anzai, J; Chem Pharm Bull 1987, V35, P4568 HCAPLUS
(4) Aquino-Binag, C; Chem Mater 1996, V8, P2579 HCAPLUS
(5) Bailey, S; J Chem Soc, Perkin Trans II 1983, P645 HCAPLUS
(6) Ben-David, O; Chem Mater 1997, V9, P2255 HCAPLUS
(7) Cheng, Q; Anal Chem 1996, V68, P4180 HCAPLUS
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L75 ANSWER 9 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 2000:272462 HCAPLUS
DN 132:276288
TI Determination of glycoprotein and glycosylated hemoglobin in blood
IN Shieh, Paul
PA USA
SO U.S., 15 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6054039	A	20000425	US 1997-914283	19970818

AB A method of detg. the concn. of glycoproteins and glycosylated Hb in whole blood and whole blood components by means of an **amperometric** biosensor and an **amperometric** biosensor for this detn. are provided. In one embodiment, whole blood is introduced into a version of an **amperometric** sensor having a component that removes erythrocytes. **Redox** mediators are used to obtain a current flow based on the oxidn. of fructosamine derivs. that can be correlated with the concn. of glycosylated proteins in the fraction of the blood from which erythrocytes have been excluded. To obtain the concn. of

glycosylated Hb, whole blood is introduced into a version of the sensor which includes a component that produces lysis of the erythrocytes yielding a current flow proportional to the total quality of glycosylated proteins including glycosylated Hb. The glycosylated Hb concn. is obtained by subtracting the glycoprotein concn. in the absence of erythrocytes from the glycoprotein concn. of the lysed whole blood. The sensor generally comprises a sensing **electrode** having a first **redox** mediator dispersed in an elec. conductive medium such as an elec. conductive graphite formulation; a ref. **electrode** such as a std. **silver-silver chloride** **electrode**; a reagent strip contg. a **pH** buffer and a second **redox** mediator system in a gel medium; and a whole blood treatment component consisting of either a membrane or other means to filter erythrocytes from whole blood or a means to lyse erythrocytes. In a preferred form, that has high sensitivity, the sensing **electrode** and the ref. **electrode** may be formed as coatings on sep. non-conductive strips such as polyester film with these strips arranged so that they form "the bread" of a sandwich in which the **electrode** coatings are face-to-face and the reagent strip and the filtration or lysing component form the "filling" of the sandwich. The filtration or **cell** lysing component covers an opening in the ref. **electrode** through which samples are introduced, and is superimposed on the reagent strip.

IT **61-73-4, Methylene blue 7440-22-4, Silver**, uses **7783-90-6, Silver chloride**, uses
RL: DEV (Device component use); USES (Uses)
(detn. of glycoprotein and glycosylated Hb in blood)

RE.CNT 8
RE
(2) Burd; US 5639672 1997 HCAPLUS
(3) Diebold; US 5437999 1995 HCAPLUS
(4) Galen; US 5695949 1997 HCAPLUS
(7) McFarland; Diabetes 1979, V28, P1011 HCAPLUS
(8) Sakamoto; US 5366868 1994 HCAPLUS
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L75 ANSWER 10 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 2000:248461 HCAPLUS
DN 133:39701
TI **Enzyme** inhibition assays with an **amperometric** glucose biosensor based on a thiolate self-assembled monolayer
AU Alexander, Peter W.; Rechnitz, Garry A.
CS Hawaii Biosensor Laboratory, Department of Chemistry, University of Hawaii at Manoa, Honolulu, HI, 96822, USA
SO Electroanalysis (2000), 12(5), 343-350
CODEN: ELANEU; ISSN: 1040-0397
PB Wiley-VCH Verlag GmbH
DT Journal
LA English
AB A new bioelectrocatalytic **enzyme** membrane for **biosensors** based on immobilization of **glucose oxidase** (GOx) is evaluated for use in inhibition assays. The objectives are to show that the newly developed glucose biosensor has advantages for inhibition assays, not as a specific glucose biosensor as such. The mediator used is 2-aminoethanethiol, which forms a self-assembled monolayer on the surface of a **gold electrode**. The membrane configuration consists of the thiol as mediator, covalently bound to the **gold** **electrode** and at the same time entrapped with GOx in a polyvinylpyridine (PVP) membrane. Cyclic voltammetric scans indicate a catalytic peak at +950 mV (vs. **Ag/AgCl**) after addn. of glucose to a blank phosphate buffer at **pH** 7.4. The PVP membranes are shown to be reusable for detn. of glucose for at least one week. As an example of inhibition of the **enzyme** reaction, the response to glucose is shown to be sensitive to the addn. of **Hg** (II) in the ppb range with a detection limit of 0.2 ppb. Interference to

CV scans from oxidizable org. compds. and other metal ions is found to be minimal, however hydrogen peroxide is the exception and interferes at 1 mM concn.

IT **7439-97-6, Mercury,** biological studies
RL: ANT (Analyte); BAC (Biological activity or effector, except adverse); ANST (Analytical study); BIOL (Biological study)
(**enzyme** inhibition assays with an **amperometric** glucose biosensor based on a thiolate self-assembled monolayer)

IT **9001-37-0D, Glucose oxidase,** immobilized
RL: BPR (Biological process); BIOL (Biological study); PROC (Process)
(**enzyme** inhibition assays with an **amperometric** glucose biosensor based on a thiolate self-assembled monolayer)

RE.CNT 38
RE
(1) Berggren, C; Electroanalysis 1999, V11, P156 HCAPLUS
(3) Cass, A; Anal Chem 1984, V56, P667 HCAPLUS
(4) Del Cerro, M; Electroanalysis 1997, V9, P1113 HCAPLUS
(5) Donlan, A; Anal Proc 1989, V26, P369 HCAPLUS
(7) Everett, W; Anal Chem 1998, V70, P807 HCAPLUS
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L75 ANSWER 11 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 2000:126145 HCAPLUS
DN 132:290595
TI Acetylthiocholine/acetylcholine and thiocholine/choline electrochemical **biosensors**/sensors based on an organically modified sol-gel glass **enzyme** reactor and graphite paste **electrode**
AU Pandey, P. C.; Upadhyay, S.; Pathak, H. C.; Pandey, C. M. D.; Tiwari, I.
CS Chemistry Department, Analytical Chemistry Division, Banaras Hindu University, Varanasi, India
SO Sens. Actuators, B (2000), B62(2), 109-116
CODEN: SABCEB; ISSN: 0925-4005
PB Elsevier Science S.A.
DT Journal
LA English
AB Electrochem. sensors for acetylthiocholine and acetylcholine are described. The non-mediated electrochem. of acetylthiocholine and thiocholine is studied on the surface of graphite paste **electrode** and results show that acetylthiocholine is directly oxidized/reduced at >0.32 V vs. **Ag/AgCl** in both acidic and basic medium. In basic medium, both cathodic and anodic peak currents are less as compared to that of the same amt. in acidic medium, which shows that the kinetics of non-**enzymic** hydrolysis of acetylcholine in electroactive thiocholine is faster in acidic medium and slower in basic medium. Thiocholine is directly oxidized/reduced at >0.35 V vs. **Ag/AgCl** with relatively larger anodic current compared to cathodic peak current similar to that of acetylcholine results recorded in acidic medium (**pH** 6.0). The electrochem. sensor/**biosensors** for acetylthiocholine/acetylcholine and thiocholine/choline are developed using two **enzyme** reactors: (1) acetylcholinesterase (AChE) encapsulated organically modified sol-gel glass, and (2) choline oxidase (ChO) immobilized within mediators (tetracyanoquinodimethane (TCNQ), tetrathiafulvalene (TTF), and di-Me ferrocene (dmFc))-modified graphite paste **electrodes**. The AChE-immobilized into organically modified sol-gel glass behaves as the reactor for **enzymic** hydrolysis of acetylthiocholine/acetylcholin e into thiocholine/choline, whereas mediator- and ChO-modified paste **electrodes** are used for the detection of thiocholine/choline through mediated mechanism. The electrochem. of AChE-generated thiocholine is studied at the mediator-modified **electrodes** in the presence and absence of ChO. It is obsd. that thiocholine undergoes both mediated and non-mediated oxidn. in the absence of ChO as well as oxidn. through **enzyme**-catalyzed mediated reactions. The results based on cyclic voltammetry on the oxidn. of thiocholine at the surface of mediator-modified **electrodes** in the presence and absence of ChO are reported. In the presence of the ChO large anodic current is obsd.

near the mediator's **redox** potentials as compared to the anodic current in the absence of **enzyme**, which shows mediated bioelectrochem. of thiocholine. The typical response curves for the detection of thiocholine/choline using mediators and ChO-modified **electrodes** below 0.24 V vs. **Ag/AgCl** in 0.1 M Tris-HCl buffer **pH** 8.0 are reported. Comparative anal. performance on the mediated electrochem. responses of the **biosensors** is discussed.

RE.CNT 23
RE
(2) Berman, H; Biochemistry 1990, V29, P10640 HCAPLUS
(4) Goodson, L; Methods Enzymol 1976, V44, P647 HCAPLUS
(5) Gruss, R; Anal Lett 1989, V22, P1159 HCAPLUS
(7) Kulys, J; Anal Chim Acta 1991, V243, P173 HCAPLUS
(8) Mascini, M; Anal Chim Acta 1986, V179, P439 HCAPLUS
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L75 ANSWER 12 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 2000:47951 HCAPLUS
DN 132:262211
TI Direct Electrochemistry of Horseradish Peroxidase Immobilized on a Colloid/Cysteamine-Modified **Gold Electrode**
AU Yi, Xiao; Huang-Xian, Ju; Hong-Yuan, Chen
CS Department of Chemistry, State Key Laboratory of Coordination Chemistry, Nanjing University, Nanjing, 210093, Peop. Rep. China
SO Anal. Biochem. (2000), 278(1), 22-28
CODEN: ANBCA2; ISSN: 0003-2697
PB Academic Press
DT Journal
LA English
AB Direct electron transfer of immobilized horseradish peroxidase on **gold** colloid and its application as a biosensor were investigated by using electrochem. methods. The **Au** colloids were assocd. with a cysteamine monolayer on the **gold electrode** surface. A pair of **redox** peaks attributed to the direct **redox** reaction of horseradish peroxidase (HRP) were obsd. at the HRP/**Au** colloid/cysteamine-modified **electrode** in 0.1 M phosphate buffer (**pH** 7.0). The surface coverage of HRP immobilized on **Au** colloid was about 7.6.times.10-10 mol/cm2. The sensor displayed an excellent electrocatalytic response to the redn. of H2O2 without the aid of an electron mediator. The calibration range of H2O2 was 1.4 .mu.M to 9.2 mM with good linear relation from 1.4 .mu.M to 2.8 mM. A detection limit of 0.58 .mu.M was estd. at a signal-to-noise ratio of 3. The sensor showed good reproducibility for the detn. of H2O2. The variation coeffs. were 3.1 and 3.9% (n = 10) at 46 .mu.M and 2.8 mM H2O2, resp. The response showed a Michaelis-Menten behavior at higher H2O2 concns. The KappM value for the H2O2 sensor was found to be 2.3 mM. (c) 2000 Academic Press.
IT **7440-57-5, Gold**, uses
RL: DEV (Device component use); USES (Uses)
(direct electrochem. of horseradish peroxidase immobilized on a colloid/cysteamine-modified **gold electrode**)
RE.CNT 34
RE
(2) Bartlett, P; Prog React Kinet 1991, V16, P55 HCAPLUS
(3) Brown, K; J Am Chem Soc 1996, V118, P1154 HCAPLUS
(4) Chut, S; Analyst 1997, V122, P1431 HCAPLUS
(5) Crumbliss, A; Biosens Bioelectron 1993, V8, P331 HCAPLUS
(6) Doron, A; Langmuir 1995, V11, P1313 HCAPLUS
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L75 ANSWER 13 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1999:408980 HCAPLUS
DN 131:184039
TI A biosensing method for detection of caffeine in coffee
AU **Pizzariello, Andrea**; Svorc, Jozef; **Stred'ansky, Miroslav**

; **Miertus, Stanislav**
CS POLYtech, Soc. Coop. r.l., Trieste, I-34012, Italy
SO J. Sci. Food Agric. (1999), 79(8), 1136-1140
CODEN: JSFAAE; ISSN: 0022-5142
PB John Wiley & Sons Ltd.
DT Journal
LA English
AB A specific inhibition of 3',5'-cyclic phosphodiesterase (CPDE) from bovine heart by methylxanthines was used in combination with a pH electrode to develop a new biosensing method for the detection of caffeine in coffee. The potential response changes of the **sensor** were proportional to the concn. of caffeine in the range 0-4 mg/mL. The response time was about 2-4 min. The std. deviation of five measurements of a 0.2 mg/mL caffeine soln. was .+-.7.1 .mu.g/mL. The electrode gave a detection limit of 0.6 mg/L caffeine. The concn. of caffeine in espresso coffee was analyzed. This model gave excellent correlation between obsd. and predicted caffeine values. This electrode exhibits advantages such as fast response, short conditioning time and low cost of the instrumentation used. The detection of caffeine in food and clin. anal. is also considered.
RE.CNT 31
RE
(1) Atay, O; Anal Lett 1997, V30, P565 HCAPLUS
(2) Beavo, J; Trends Pharmacol Sci 1990, V11, P150 HCAPLUS
(3) Bouhsain, Z; Analyst 1997, V122, P441 HCAPLUS
(4) Bradford, M; Anal Biochem 1976, V72, P248 HCAPLUS
(5) Budvaribarany, Z; J Liq Chromatogr Relat Technol 1997, V20, P1233 HCAPLUS
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L75 ANSWER 14 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1999:209591 HCAPLUS
DN 131:55915
TI The improved potentiometric **pH** response of **electrodes** modified with processible polyaniline. Application to glucose biosensor
AU Karyakin, Arkady A.; Lukachova, Lylia V.; Karyakina, Elena E.; Orlov, Andrey V.; Karpachova, Galina P.
CS Faculty of Chemistry, M.V. Lomonosov Moscow State University, Moscow, 119899, Russia
SO Anal. Commun. (1999), 36(4), 153-156
CODEN: ANCOFE; ISSN: 1359-7337
PB Royal Society of Chemistry
DT Journal
LA English
AB Processible polyaniline (PCPAn) modified **electrodes** are characterized by an advanced potentiometric **pH** response in comparison to those based on regular polyaniline. **Glassy carbon electrodes** modified with PCPAn by dip-coating exhibited a fully reversible potentiometric response of approx. 90 mV **pH**-1 over the range **pH** 3-9. Such significantly higher potentiometric responses of PCPAn modified **electrodes** compared to existing devices is explained on the basis of the thermodn. of polyaniline **redox** reactions. The potentiometric biosensor for glucose based on processible polyaniline has been developed using a non-aq. **enzymol.** approach for **enzyme** immobilization. In the model soln., which mimics blood serum, the biosensor was useful for glucose detection over the concn. range 0.1-30 mM and the max. response value reached was .apprxeq.80 mV. The advanced potentiometric response of PCPAn modified **electrodes** provides their application for sensor and biosensor development.
IT **7440-44-0**, Carbon, uses
RL: NUU (Other use, unclassified); USES (Uses)
(glassy **electrodes**; improved potentiometric **pH** response of **electrodes** modified with processible polyaniline and application to glucose biosensor)
IT **9001-37-0, Glucose oxidase**
RL: ARG (Analytical reagent use); ANST (Analytical study); USES (Uses)

(improved potentiometric **pH** response of **electrodes** modified with processible polyaniline and application to glucose biosensor)

RE.CNT 24

RE

(2) Cao, Y; Synth Met 1993, V57, P3514 HCAPLUS
(3) Cao, Y; Synth Met 1995, V69, P187 HCAPLUS
(4) Diaz, A; J Electroanal Chem 1980, V111, P111 HCAPLUS
(6) Focke, W; J Phys Chem 1987, V91, P5813 HCAPLUS
(7) Hoa, D; Anal Chem 1992, V64, P2645 HCAPLUS

ALL CITATIONS AVAILABLE IN THE RE FORMAT

L75 ANSWER 15 OF 58 HCAPLUS COPYRIGHT 2001 ACS

AN 1999:127046 HCAPLUS

DN **130:150618**

TI Ion-sensitive sensor devices with diamond-like carbon coating and analytical methods using them

IN Vadgama, Pankaj Madganlal; Warriner, Keith Stewart Robert

PA The Victoria University of Manchester, UK

SO PCT Int. Appl., 22 pp.
CODEN: PIXXD2

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9907878	A1	19990218	WO 1998-GB2301	19980731
	W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
	RW: GH, GM, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
	GB 2328023	A1	19990210	GB 1997-16749	19970808
	AU 9886360	A1	19990301	AU 1998-86360	19980731
PRAI	GB 1997-16749		19970808		
	WO 1998-GB2301		19980731		

AB Disclosed are improved sensor devices responsive to ionic changes, and esp. **pH** changes, of media in contact with them, wherein the sensor element is coated with diamond-like carbon, and anal. methods for their use. The device is esp. applicable to systems in which the **pH** change measured is the result of **enzyme** action, particularly by formation of a basic product, for example using **urease** as the **enzyme** to form ammonia from urea. The preferred sensor element is a solid-state device, notably an **enzyme** field effect transistor in which the **enzyme** is bound on the surface of a semiconductor in conjunction with a conducting polymer, preferably polypyrrole. Detns. are usually made by measurement of the impedance of the sensor when in contact with a buffered soln. of the sample to be examd., and can be used for detg. urea levels in blood. A urea-sensitive **urease**/polypyrrole impedimetric sensor was prepd. having immobilized **urease** and an outer coating of diamond-like carbon (DLC). Sensors with the DLC coating had lower responses to urea than those not coated, but, more importantly, they were almost independent of soln. buffering capacity (content of buffer salts).

IT **7440-57-5, Gold**, uses
RL: DEV (Device component use); USES (Uses)
(as layer in interdigitated microelectrodes; ion-sensitive sensor devices with diamond-like carbon coating and anal. methods using them)

IT **7440-44-0**, Carbon, uses
RL: DEV (Device component use); USES (Uses)
(diamond-like, as coating on sensor; ion-sensitive sensor devices with diamond-like carbon coating and anal. methods using them)

IT **9002-13-5D, Urease**, immobilized

RL: ARG (Analytical reagent use); BAC (Biological activity or effector, except adverse); DEV (Device component use); ANST (Analytical study); BIOL (Biological study); USES (Uses)
(in urea-sensitive impedimetric sensor; ion-sensitive sensor devices with diamond-like carbon coating and anal. methods using them)

IT **9002-13-5, Urease**
RL: ARG (Analytical reagent use); BAC (Biological activity or effector, except adverse); DEV (Device component use); ANST (Analytical study); BIOL (Biological study); USES (Uses)
(sensor contg.; ion-sensitive sensor devices with diamond-like carbon coating and anal. methods using them)

RE.CNT 4
RE
(1) Higson, S; Analytica Chimica Acta 1993, V271(1), P125
(2) Ici Plc; EP 0503943 A 1992 HCAPLUS
(3) Thermo Fast U K Limited; WO 9810288 A 1998 HCAPLUS
(4) Univ Manchester; WO 9324828 A 1993 HCAPLUS

L75 ANSWER 16 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1999:80844 HCAPLUS
DN 130:280983
TI Determination of D-fructose in foodstuffs by an improved amperometric **biosensor** based on a solid binding matrix
AU **Stredansky, M.; Pizzariello, A.; Stredanska, S.; Miertus, Stanislav; Miertus, Stanislav**
CS POLY-tech, Trieste, 34012, Italy
SO Anal. Commun. (1999), 36(2), 57-61
CODEN: ANCOFE; ISSN: 1359-7337
PB Royal Society of Chemistry
DT Journal
LA English
AB An improved amperometric **biosensor** based on a solid binding matrix (SBM) composite transducer was used for the detn. of D-fructose in foodstuffs samples. The enzyme, D-fructose dehydrogenase (EC 1.1.99.11), was incorporated directly into a solid composite transducer contg. both 2-hexadecanone as SBM and chem. modified graphite. Hexacyanoferrate(III) was used as a redox mediator and the current variation caused by the presence of D-fructose was measured amperometrically. The electrochem. properties and the characteristics of the composite fructose **biosensors** are described. The amperometric signals were fast, reproducible and linearly proportional to D-fructose concns. in the range 50 .times. 10-6-10 .times. 10-3 mol/L, with a correlation coeff. of 0.999. A set of measurements at +0.20 V vs. SCE for 2 .times. 10-3 mol/L D-fructose yielded a relative std. deviation for the steady-state current of 2.11%. The use of a chem. modified graphite by a mild oxidn. step was shown to improve the **biosensor** selectivity against anionic interferents such as L-ascorbate. The **biosensor** proved to be stable for 6 mo and the assay of D-fructose by this electrode was not influenced by the presence of sugars or other interferents commonly found in food samples. The **biosensor** was used for the detn. of D-fructose in some food samples, and the results were consistent with those obtained with the com. available D-fructose enzyme photometric kit.

RE.CNT 34
RE
(1) Abu-Lehia, I; Food Chem 1987, V24, P233 HCAPLUS
(2) Amine, A; Anal Lett 1993, V26, P1281 HCAPLUS
(3) Andrieux, C; J Electroanal Chem 1995, V394, P141 HCAPLUS
(4) Antiochia, R; Anal Lett 1997, V30, P683 HCAPLUS
(6) Chen, P; Anal Chem 1996, V68, P3958 HCAPLUS
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L75 ANSWER 17 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1999:35895 HCAPLUS
DN 130:193767
TI Electrochemistry of reconstituted **glucose oxidase** on carbon paste **electrodes**

AU Savitri, D.; Mitra, Chanchal K.
CS Dep. Biochem., School Life Sciences, Univ. Hyderabad, Hyderabad, 500 046, India
SO Bioelectrochem. Bioenerg. (1998), 47(1), 67-73
CODEN: BEBEBP; ISSN: 0302-4598
PB Elsevier Science S.A.
DT Journal
LA English
AB FAD was covalently immobilized onto **glassy carbon** matrix using a 13-carbon atom long spacer arm. FAD modified **electrodes** offer a convenient handle for immobilizing **glucose oxidase** (GOD) **enzyme** for direct electron transfer. The electrochem. characteristics of immobilized FAD were compared with free FAD in soln. at blank paste **electrode** surface. The prominent peaks are well sepd. from the oxidn. and the immobilized FAD shows more reversible behavior compared to the free FAD in soln. GOD apoenzyme has been prepd. by acidification of GOD soln. (5 mg/mL) in buffer (100 mM sodium acetate) using ammonium sulfate soln. at **pH** 1.4. The apoenzyme was coupled to the FAD modified matrix by incubating the matrix with the soln. of apoenzyme for 4-12 h. The paste **electrode** with reconstituted GOD was investigated for its electrochem. characteristics and for its response with substrate (glucose soln.). Our major finding is that the reconstituted **enzyme** shows better electron transfer rates compared to normal **enzyme.** The reason for this can be attributed to the long spacer arm holding the electroactive FADS which facilitates better electron transfer between **enzyme redox** center and **electrode** surface. The above technique appears to be a promising approach to be used in biosensor application.
IT **9001-37-0, Glucose oxidase**
RL: ARG (Analytical reagent use); DEV (Device component use); ANST (Analytical study); USES (Uses)
(electrochem. of reconstituted **glucose oxidase** on carbon paste **electrodes**)
RE.CNT 29
RE
(3) Bourdillon, C; J Am Chem Soc 1993, V115, P2 HCAPLUS
(4) Cass, A; Anal Chem 1984, V56, P667 HCAPLUS
(5) Cass, A; J Electroanal Chem Interfacial Electrochem 1985, V190, P117 HCAPLUS
(6) Cho, Y; Biotechnol Bioeng 1977, V19, P769 HCAPLUS
(7) Dautartas, M; Anal Chem 1979, V51, P104 HCAPLUS
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L75 ANSWER 18 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1998:766614 HCAPLUS
DN 130:181621
TI **Biosensors** for L-malate and L-lactate based on solid binding matrix
AU Katrlik, Jaroslav; **Pizzariello, Andrea**; Mastihuba, Vladimir; Svorc, Jozef; **Stred'ansky, Miroslav**; **Miertus, Stanislav**
CS Area Science Park, POLYtech s.c.r.l., Trieste, 34012, Italy
SO Anal. Chim. Acta (1999), 379(1-2), 193-200
CODEN: ACACAM; ISSN: 0003-2670
PB Elsevier Science B.V.
DT Journal
LA English
AB **Biosensors** for the selective detn. of L-lactate and L-malate in wine based on robust solid composite transducers are presented. Transducers comprised a solid binding matrix having hydrophobic skeleton, e.g. 2-hexadecanone, graphite and NAD+. The enzymes, L-malate or L-lactate dehydrogenase and diaphorase, were placed onto the transducer surface and covered by a dialysis membrane, which substantially reduced interferences derived from easily oxidizable compds., e.g. polyphenols, of wine. Hexacyanoferrate(III) was used as a mediator. The electrode responses were linear up to 1.1 mM for L-malate and 1.3 mM for L-lactate.

The detection limit was at about 10 .mu.M. The **biosensors** showed an excellent long-term stability, after five months storage at room temp., the L-malate **sensor** exhibited almost 100% and L-lactate 90% of the initial sensitivity. A **multisensor** composed of two enzyme electrodes allowing a simultaneous detn. of L-malate and L-lactate was also constructed. The results obtained from the detn. of both acids in wine samples by **biosensors** were in a good agreement with those obtained by liq. chromatog.

RE.CNT 23
RE
(1) Boujtita, M; Electroanalysis 1996, V8, P485 HCAPLUS
(3) Gorton, L; Electroanalysis 1995, V7, P23 HCAPLUS
(4) Jobst, G; Anal Chem 1996, V68, P3173 HCAPLUS
(5) Katrlik, J; Biosenors and Bioelectronics 1998, V13, P181 HCAPLUS
(6) Palleschi, G; Talanta 1994, V41, P917 HCAPLUS
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L75 ANSWER 19 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1998:726956 HCAPLUS
DN 130:65418
TI Amperometric **biosensors** based on solid binding matrixes applied in food quality monitoring
AU **Miertus, Stanislav**; Katrlik, Jaroslav; **Pizzariello, Andrea**; **Stred'ansky, Miroslav**; Svitel, Juraj; Svorc, Jozef
CS International Centre for Science and High Technology, UNIDO Area/Science Park, Trieste, 34122, Italy
SO Biosens. Bioelectron. (1998), 13(7-8), 911-923
CODEN: BBIOE4; ISSN: 0956-5663
PB Elsevier Science Ltd.
DT Journal
LA English
AB Solid binding matrix (SBM) based composite transducers have been used for development of series of **multibiosensor** systems applicable in various fields. The authors present two hybrid three-channel **multibiosensors** for simultaneous amperometric operation in food quality control, i.e., a glucose/fructose/ethanol **multibiosensor** , based on glucose oxidase/fructose dehydrogenase/alc. dehydrogenase surface-modified enzyme electrodes and L-lactate/L-malate/sulfite **multibiosensor**, based on L-lactate dehydrogenase/L-malate dehydrogenase/sulfite oxidase surface-modified enzyme electrodes. Different parameters were studied in order to optimize the response of the **multibiosensor** systems. The **multibiosensor** showed a good sensitivity, linear range and storage stability. The **multibiosensors** were used for the detn. of glucose, fructose, ethanol, L-lactate, L-malate and sulfite in samples of wine, resulting in a good agreement with data certified by the supplier. A comparison of various designs (surface-modified, bulk-modified and thick-cover) of SBM based **biosensors** is made in terms of the example of a fructose **biosensor**.

RE.CNT 35
RE
(1) Adeloju, S; Electroanalysis 1994, V6, P865 HCAPLUS
(2) Alegret, S; Biosensors and Bioelectronics 1996, V11, P35 HCAPLUS
(3) Andrieux, C; J Electroanal Chem 1995, V394, P141 HCAPLUS
(5) Cho, J; Denki Kagaku 1995, V63, P1143 HCAPLUS
(6) Garcia, C; J Eletroanal Chem 1996, V418, P147 HCAPLUS
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L75 ANSWER 20 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1998:564020 HCAPLUS
DN 129:336876
TI A reagentless **amperometric** hydrogen peroxide biosensor based on covalently binding horseradish peroxidase and thionine using a thiol-modified **gold electrode**
AU Ruan, Chuanmin; Yang, Ru; Chen, Xiaohong; Deng, Jiaqi
CS Department of Chemistry, Fudan University, Shanghai, 200433, Peop. Rep.

China
SO J. Electroanal. Chem. (1998), 455(1-2), 121-125
CODEN: JECHES; ISSN: 0368-1874
PB Elsevier Science S.A.
DT Journal
LA English
AB A new approach to construct a reagentless hydrogen peroxide biosensor is described. Horseradish peroxidase and thionine are covalently bound to a cysteamine-assembled **gold electrode** using glutaraldehyde as a bifunctional reagent. Thionine immobilized in this way can shuttle electrons between the **electrode** and the **redox** activity center of the **enzyme**. The sensor was highly sensitive to hydrogen peroxide with a detection limit of 8.0.times.10-7 mol l-1 and a response time of less than 4 s. The effects of the applied potential and the **pH** values of the buffer soln. on the response of the sensor were investigated for optimum anal. performance.
IT **7440-57-5, Gold**, uses
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(reagentless **amperometric** hydrogen peroxide biosensor based on covalently binding horseradish peroxidase and thionine using thiol modified **gold electrode**)

L75 ANSWER 21 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1998:505362 HCAPLUS
DN 129:257226
TI Composite **biosensor** for sulfite assay. Use of water-insoluble hexacyanoferrate(III) salts as electron-transfer mediators
AU Svitel, Juraj; **Stredansky, Miroslav; Pizzariello, Andrea ; Miertus, Stanislav**
CS POLY-Tech, Trieste, I-34012, Italy
SO Electroanalysis (1998), 10(9), 591-596
CODEN: ELANEU; ISSN: 1040-0397
PB Wiley-VCH Verlag GmbH
DT Journal
LA English
AB Water-insol. salts of hexacyanoferrate(III) and cationic surface active agents were synthesized and used as electron-mediators for sulfite oxidase. The **biosensor** was prepd. from a composite consisting of modified graphite (50% wt./wt.) and n-eicosane (50% wt./wt.). Graphite was modified with mediators or with both mediator and sulfite oxidase for surface- and hulk-modified electrode, resp. The main advantage of **biosensors** with insol. mediators is the possibility to operate at a potential of 0 mV (vs. SCE), thus less interferences are expected, in comparison to sol. hexacyanoferrate(III) where a potential of +300 mV must be used. The max. sensitivity 7.8 .times. 10-4 .mu.A/.mu.M was obtained for bulk-modified **biosensor**, prepd. from graphite modified with 5% wt./wt. of hexadecyltrimethylammonium hexacyanoferrate(III) and 1.25 units/mg (of graphite) of sulfite oxidase. The sensitivity of the **biosensor** decreased to 24% of the initial sensitivity after one month storage in dry state at ambient temp. The use of trehalose as an enzyme stabilization agent has led to the improved stability: 40% of the initial stability was retained after one month.

L75 ANSWER 22 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1998:366781 HCAPLUS
DN 129:133281
TI Mediated reagentless **enzyme** inhibition **electrodes**
AU Daigle, F.; Trudeau, F.; Robinson, G.; Smyth, M. R.; Leech, D.
CS Dep. Chim., Univ. Montreal, Montreal, PQ, H3C 3J7, Can.
SO Biosens. Bioelectron. (1998), 13(3-4), 417-425
CODEN: BBIOE4; ISSN: 0956-5663
PB Elsevier Science Ltd.
DT Journal
LA English
AB We have investigated the use of the copper-contg. oxygenase

enzymes; laccase, tyrosinase and ceruloplasmin as reagentless **enzyme** activity sensors. The system is based on the mediated redn. of oxygen by the **enzymes** co-immobilized in an osmium **redox** polymer hydrogel on **glassy carbon** **electrode** surfaces. Both laccase and tyrosinase present rapid homogeneous second-order rate consts. for the interaction with a model monomer, [Os(2,2'-bipyridine)2(N-methylimidazole)Cl]+ (OsMeIm). Ceruloplasmin rates are several orders of magnitude slower and no catalytic currents are obsd. upon co-immobilization of this **enzyme** in the **redox** hydrogel. The activity of the immobilized laccase and tyrosinase sensors is shown to be influenced by the **enzyme** loading in the deposition soln., the electrolyte **pH** and ionic strength. The immobilized sensors can be utilized for the detection of modulators of **enzyme** activity, such as the respiratory poison azide. Reproducible inhibition curves can be obtained by normalization of the sensor response. The resulting **enzyme** inhibition **biosensors** can detect levels of azide as low as 1 .mu.M in soln. and may be useful as an early warning sensor for the presence of such respiratory toxins.

L75 ANSWER 23 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1998:285130 HCAPLUS
DN 129:38176
TI Composite alcohol **biosensors** based on solid binding matrix
AU Katrlik, Jaroslav; Svorc, Jozef; **Stred'ansky, Miroslav**; **Miertus, Stanislav**
CS POL Ytech, Area di Ricerca, Trieste, 34012, Italy
SO Biosens. Bioelectron. (1998), 13(2), 181-191
CODEN: BBIOE4; ISSN: 0956-5663
PB Elsevier Science Ltd.
DT Journal
LA English
AB A group of solid compds. with amphiphilic character called solid binding matrixes (SBMs), which present a new concept of solid composite transducer for amperometric **biosensors**, were used for construction of robust solid alc. **biosensors**. The enzymes, alc. dehydrogenase (ADH) and diaphorase (DP) were either placed on the surface of the SBM-based transducer contg. NAD- or they were incorporated together with NAD+ directly into the transducer. The use of various mediators (org. dyes, vitamin K3, hexacyanoferrate(III), ferrocene) and methods of **biosensor** construction were studied. The electrochem. properties and the characteristics of the composite ethanol **biosensors** are described. The electrode response was fast and reproducible. As the response to ethanol in the range 0.2-4.0 mM was not linear, the calibration curves were transformed (1/.DELTA.i = f(1/c)) to obtain the linear dependencies. The **biosensors** were used for the detn. of ethanol in samples of wine, resulting in a good agreement with data detd. by photometric measurements after distn. of the sample (av. percentage accuracy was 2% for surface layer-modified and 2.5% for bulk-modified bioelectrodes). The surface-modified **sensors** remained stable for at least 3 mo. The sensitivity of bulk-modified **sensors** decreased to 60-85% of the initial value after 1 mo, but after electrode surface renewal about 90% of initial sensitivity was found.

L75 ANSWER 24 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1998:176723 HCAPLUS
DN 128:240643
TI Continuous flow **immunosensor** for atrazine detection
AU Vianello, F.; Signor, L.; **Pizzariello, A.**; Di Paolo, M. L.; Scarpa, M.; Hock, B.; Giersch, T.; Rigo, A.
CS Department of Biological Chemistry, University of Padova, Padua, 35121, Italy
SO Biosens. Bioelectron. (1998), 13(1), 45-53
CODEN: BBIOE4; ISSN: 0956-5663
PB Elsevier Science Ltd.
DT Journal

LA English
AB The hapten atrazine was detected under continuous flow conditions using a micro-column which contained immobilized monoclonal antibodies (Ab) against atrazine and atrazine labeled with alk. phosphatase (An*). The equil. of the antibody-hapten system, was achieved by a continuous flow of the tracer An* through the micro-column contg. the immobilized antibodies. The activity of the tracer was monitored continuously, after the microcolumn, by an amperometric detector using p-hydroquinone phosphate as substrate. When pulses of unlabeled atrazine (An) were added to the An* flowing continuously through the micro-column, An* bound to the antibody was displaced, with a consequent change of the detector signal. By this method atrazine concns. in the range 9-180 .mu.g/l were monitored under conditions of continuous operation. Since the equil. condition for the system Ab-An* was continuously restored by the flow of An* through the micro-column the regeneration of the antibody was not required.

L75 ANSWER 25 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1998:127807 HCAPLUS
DN 128:253087
TI Biosensor for neurotransmitter L-glutamic acid designed for efficient use of L-**glutamate oxidase** and effective rejection of interference
AU Ryan, Michael R.; Lowry, John P.; O'Neill, Robert D.
CS Dep. of Chemistry, University College Dublin, Dublin, Ire.
SO Analyst (Cambridge, U. K.) (1997), 122(11), 1419-1424
CODEN: ANALAO; ISSN: 0003-2654
PB Royal Society of Chemistry
DT Journal
LA English
AB An **amperometric** biosensor for L-glutamic acid (Glu) was constructed by the adsorption and dip coating of L-**glutamate oxidase** (GluOx, 200 U ml-1 phosphate buffer, **pH** 7.4) onto 60-.mu.m radius Teflon-coated **Pt** wire (1 mm exposed length). The **enzyme** was then trapped on the surface by electropolymn. of o-**phenylenediamine** that also served to block electroactive interference. This procedure afforded **electrodes** with similar substrate sensitivity compared with the classical approach of immobilizing **enzyme** from a soln. of monomer, and represents an approx. 10,000-fold increase in the yield of **biosensors** from a batch of **enzyme**. A no. of strategies were examd. to enhance the sensitivity and selectivity of the **Pt**/PPD/GluOx sensors operating at 0.7 V vs. SCE. Pre-coating the **Pt** with lipid and incorporation of the protein bovine serum albumin into the polymer matrix were found to improve the performance of the **electrode**. The sensors had a fast response time, high sensitivity to Glu, with an LOD of about 0.3 .mu.mol l-1, and possessed selectivity characteristics suggesting that monitoring Glu in biol. **tissues** in vivo may be feasible.
IT **7440-06-4, Platinum**, uses
RL: ARG (Analytical reagent use); ANST (Analytical study); USES (Uses)
(biosensor for neurotransmitter glutamic acid designed for efficient use of **glutamate oxidase** and effective rejection of interference)

L75 ANSWER 26 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1998:88111 HCAPLUS
DN 128:106094
TI Development of Tyrosinase-Based **Biosensor** and Its Application for Monitoring of Bioremediation of Phenol and Phenolic Compounds
AU Svitel, Juraj; **Miertus, Stanislav**
CS POLY-tech, Trieste, I-34012, Italy
SO Environ. Sci. Technol. (1998), 32(6), 828-832
CODEN: ESTHAG; ISSN: 0013-936X
PB American Chemical Society
DT Journal
LA English

AB A tyrosinase-modified solid composite **biosensor** has been developed, and its application for the detn. of phenol and related compds. in environmental samples was studied. The composite transducer for amperometric **biosensor** was based on graphite powder modified with tyrosinase and 2-hexadecanol used as a solid binding matrix. The response of a **biosensor** modified with 4% of tyrosinase was linear up to 2.5 .mu.M, the sensitivity was 0.0225 .mu.A/.mu.M, and the detection was limit 0.2 .mu.M. Various parameters influencing **biosensor** performance have been also studied: working potential, buffer concn., pH, and response with other compds. The sensitivity of **biosensor** without surface renewal decreased to 20% of the initial value after 1 mo. The sensitivity is restored after surface renewing. The **biosensor** was tested in lab.-scale expts. for monitoring of phenol bioremediation in water and soil. The **biosensor** was also tested for anal. of other phenolic wastes: leachate from leather processing contg. chlorophenols and waste from oil processing contg. polyphenols.

L75 ANSWER 27 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1997:811673 HCAPLUS
DN 128:151332
TI Mediator type of glucose microbial **biosensor** based on Aspergillus niger
AU Katrlik, J.; Brandsteter, R.; Svorc, J.; Rosenberg, M.; **Miertus, S.**
CS Department of Analytical Chemistry, Slovak Technical University, Radlinskeho 9, Bratislava, 81237, Slovakia
SO Anal. Chim. Acta (1997), 356(2-3), 217-224
CODEN: ACACAM; ISSN: 0003-2670
PB Elsevier Science B.V. .
DT Journal
LA English
AB Whole cells of Aspergillus niger CCM 8004 contg. glucose oxidase (EC 1.1.3.4.) were used for the construction of an amperometric microbial mediated carbon paste **biosensor**. The microorganism was either placed on the surface of the electrode or incorporated directly into the carbon paste. The mediators were either dissolved in the buffer (hexacyanoferrate(III) and ferrocene) or loaded in the carbon paste (ferrocene). All methods resulted in effective glucose amperometric **biosensors**. The operational stability of the surface-layer modified whole cell **biosensor** based on ferrocene incorporated into the carbon paste was at least one month, the upper linearity limit was 6 mM. The **sensor** was used for measuring the glucose content in real samples.

L75 ANSWER 28 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1997:788374 HCAPLUS
DN 128:20229
TI Stabilization of an osmium bis-bipyridyl polymer-modified carbon paste **amperometric** glucose biosensor using polyethyleneimine
AU Jezkova, Jitka; Iwuoha, Emmanuel I.; Smyth, Malcolm R.; Vytras, Karel
CS Biomedical Environmental Sensor Technology Center, School Chemical Sciences, Dublin City University, Dublin, Ire.
SO Electroanalysis (1997), 9(13), 978-984
CODEN: ELANEU; ISSN: 1040-0397
PB Wiley-VCH Verlag GmbH
DT Journal
LA English
AB The modification of C paste **electrodes** by incorporation of the **enzyme glucose oxidase** (GOx) and a conducting **redox** Os bis-bipyridyl poly(4-vinylpyridine) polymer (Os-polymer) is described. The resulting **enzyme electrodes** were operated as **amperometric** glucose sensors in the presence or absence of a stabilizer, polyethyleneimine (PEI), mixed into the paste. Cyclic voltammetric studies showed that Os-polymer contg. Os2+/3+ **redox** couple mediated the electron transfer from reduced GOx to

the C paste **electrode** material. Steady-state **amperometric** responses of the sensors to 2-120 mM glucose at an operating potential of 350 mV (vs. **Ag/AgCl**) were detd. in 0.1 M phosphate buffer (**pH** 7.0) medium. PEI enhances both, the sensitivity and stability of the C paste **enzyme electrode** and a diffusion-limited step precedes electrocatalytic reactions of the biosensor. Cyclic voltammetric data and the Arrhenius anal. of the apparent turnover rate const., k'cat, showed that PEI decreases the diffusion limitations of CPE, thereby increasing the frequency of collision of reacting species in this biosensor format.

IT **9001-37-0, Glucose oxidase**
RL: ARG (Analytical reagent use); ANST (Analytical study); USES (Uses)
(stabilization of an osmium bis-bipyridyl polymer-modified C paste **amperometric** glucose biosensor using polyethyleneimine)

L75 ANSWER 29 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1997:771440 HCAPLUS
DN 128:99407
TI **Enzymically** prepared poly(hydroquinone) as a mediator for **amperometric** glucose sensors
AU Wang, Ping; Amarasinghe, Sudath; Leddy, Johna; Arnold, Mark; Dordick, Jonathan S.
CS Department of Chemical and Biochemical Engineering, University of Iowa, Iowa City, IA, 52242, USA
SO Polymer (1997), Volume Date 1998, 39(1), 123-127
CODEN: POLMAG; ISSN: 0032-3861
PB Elsevier Science Ltd.
DT Journal
LA English
AB Poly(hydroquinone) (**PHQ**), synthesized from glucose-.beta.-D-hydroquinone by peroxidase-catalyzed polymn. in aq. soln. and placed on **glassy carbon electrodes**, behaves as a **redox** mediator for glucose sensing. The highly selective nature of **enzymic** catalysis leads to **PHQ** with a unique structure which is more sol. in org. solvents and more electrochem. active, as compared to that prepd. via electrochem. methods. A glucose sensor is constructed in a pellet form with **PHQ**, **glucose oxidase** (GOD) and graphite powder. **PHQ** retains its **redox** activity and reversibility in the solid state and effectively mediates the electron transfer between the **electrode** and GOD. Resulting glucose **biosensors** possess sub-minute response times over a dynamic range from 1 to 30 mM. The **PHQ** mediator permits sensor operation at 100 mV (vs. SCE), thereby reducing susceptibility toward common endogenous, easily oxidizable interferences.

IT **9001-37-0, Glucose oxidase**
RL: ARG (Analytical reagent use); DEV (Device component use); ANST (Analytical study); USES (Uses)
(**enzymically** prepd. poly(hydroquinone) as a mediator for **amperometric** glucose sensors)

L75 ANSWER 30 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1997:598193 HCAPLUS
DN 127:244587
TI Reagentless Tyrosinase **Enzyme Electrodes**: Effects of **Enzyme** Loading, Electrolyte **pH**, Ionic Strength, and Temperature
AU Daigle, F.; Leech, D.
CS Departement de Chimie, Universite de Montreal, Montreal, PQ, H3C 3J7, Can.
SO Anal. Chem. (1997), 69(20), 4108-4112
CODEN: ANCHAM; ISSN: 0003-2700
PB American Chemical Society
DT Journal
LA English
AB We have prepd. a reagentless **enzyme** activity sensor based on the mediated redn. of oxygen by tyrosinase coimmobilized in an osmium **redox** polymer hydrogel on **glassy carbon**

electrode surfaces. The activity of this sensor is shown to be influenced by the **enzyme** loading, yielding an optimum activity for 41.7% (wt./wt.) **enzyme** in the deposition soln. The electrolyte **pH**, ionic strength, and temp. also affect the **electrode** response by altering **enzyme** activity, charge transport rates, and mediator concn. in the films. The response of the sensor decreases by only 25% over a 6-h period. However, reproducible inhibition curves can be obtained by normalization of the sensor response. The resulting **enzyme** inhibition biosensor can detect levels of the **enzyme** inhibitor, azide, as low as 1.0.times.10-5 mol/dm3 in soln. The immobilized sensors can be utilized for the detection of modulators of tyrosinase **enzyme** activity, such as respiratory poison inhibitors.

L75 ANSWER 31 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1997:283690 HCAPLUS
DN 126:290281
TI Composite Transducers for Amperometric **Biosensors**. The Glucose **Sensor**
AU Svorc, Jozef; **Miertus, Stanislav**; Katrlik, Jaroslav; **Stredansky, Miroslav**
CS Area di Ricerca, POLY-tech, Trieste, 34012, Italy
SO Anal. Chem. (1997), 69(11), 2086-2090
CODEN: ANCHAM; ISSN: 0003-2700
PB American Chemical Society
DT Journal
LA English
AB A new concept of a composite transducer for amperometric **biosensors** based on the use of a solid substance with amphiphilic character (called a solid binding matrix, SBM) is presented. The electrochem. properties of the transducers prepd. with five different SBMs and the characteristics and performance of SBM-based glucose **sensors** prepd. by three different methods are described. **Biosensor** stability is evaluated and discussed. The **biosensor** was used for the detn. of glucose in wine, yielding results which were consistent with those obtained with the com. available Glucose Enzyme Photometric Kit. The av. accuracy was 6% for the whole range of analyzed concns. (0.2-47 g/L) using the same sample diln. in a buffer.

L75 ANSWER 32 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1997:181168 HCAPLUS
DN 126:168818
TI Electrochemical **biosensors** and process for their preparation
IN Svorc, Josef; **Miertus, Stanislav; Stredansky, Miroslav**
PA **Saicom S.R.L., Italy**; Svorc, Josef; Miertus, Stanislav; Stredansky, Miroslav
SO PCT Int. Appl., 47 pp.
CODEN: PIXXD2
DT Patent
LA English
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI WO 9702359	A1	19970123	WO 1996-EP2919	19960703
W: AL, AM, AU, AZ, BB, BG, BR, BY, CA, CN, CZ, EE, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, RO, RU, SD, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US				
RW: KE, LS, MW, SD, SZ, UG, AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG				
AU 9665181	A1	19970205	AU 1996-65181	19960703
EP 847447	A1	19980617	EP 1996-924868	19960703
EP 847447	B1	19991110		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, PT, IE,				

SI, FI

AT 186572	E	19991115	AT 1996-924868	19960703
ES 2141518	T3	20000316	ES 1996-924868	19960703
PRAI IT 1995-MI1441		19950705		
WO 1996-EP2919		19960703		

AB The present invention concerns new electrochem. **biosensors** for the detn. of analytes concn. in sample solns. or suspensions, based on composite transducers contg. an electro-conducting material, in the form of powder or grains, a chem. mediator, optionally a substance capable of sorption of said chem. mediator, and a solid binding maker, which is a compd. in solid state at room temp.; said **biosensors** are prepd. by incorporating a biocatalyst into the bulk of said composite transducers or by applying a biocatalytic layer onto their surface. Prepn. of a "bulk" **biosensor** for the detn. of glucose, contg. monostearoyl glycerol as solid binding maker is described.

L75 ANSWER 33 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1997:148533 HCAPLUS
DN 126:154690
TI Reagentless Mediated Laccase **Electrode** for the Detection of **Enzyme** Modulators
AU Trudeau, Francis; Daigle, Francis; Leech, Donal
CS Departement de Chimie, Universite de Montreal, Montreal, PQ, QUEBEC, Can.
SO Anal. Chem. (1997), 69(5), 882-886
CODEN: ANCHAM; ISSN: 0003-2700
PB American Chemical Society
DT Journal
LA English
AB We have investigated aerobic mediation of electron transfer to a laccase **enzyme** by the soln. **redox** couples [Os(bpy)2Cl2]+/0 and [Os(bpy)2(MeIm)Cl]2+/+, where bpy is 2,2-bipyridine and MeIm is N-methylimidazole. The factors that influence the homogeneous mediation reaction are investigated and discussed. Investigation of ionic strength, **pH**, and temp. effects on the kinetics of intermol. electron transfer elucidates the governing factors in the mediator-**enzyme** reactions. Coimmobilization of both **enzyme** and an osmium **redox** mediator in a hydrogel on **glassy carbon** **electrodes** results in a biosensor for the reagentless addressing of **enzyme** activity, consuming only oxygen present in soln. Thus, these immobilized **enzyme biosensors** can be utilized for the detection of modulators of laccase activity, such as the inhibitor sodium azide. The **enzyme** inhibition biosensor can detect levels of azide as low as 2.5 .times. 10-6 mol dm-3 in soln.

L75 ANSWER 34 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1997:39908 HCAPLUS
DN **126:141562**
TI A reagentless biosensor highly sensitive to hydrogen peroxide based on new **methylene blue** N dispersed in Nafion gel as the electron shuttle
AU Liu, Haiying; Ying, Tailin; Sun, Kang; Qi, Deyao
CS Dep. Chem. Chemical Eng., Shanghai Univ., Shanghai, 200072, Peop. Rep. China
SO J. Electroanal. Chem. (1996), 417(1-2), 59-64
CODEN: JECHES; ISSN: 0368-1874
PB Elsevier
DT Journal
LA English
AB A reagentless biosensor highly sensitive to hydrogen peroxide was constructed by immobilizing horseradish peroxidase on Nafion-new **methylene blue** N modified **electrode.** Cyclic voltammetry and chronoamperometry were for the first time employed to demonstrate the feasibility of electron transfer between immobilized horseradish peroxidase and a **glassy carbon** **electrode** via new **methylene blue** N incorporated in Nafion gel. Performance and characteristics of the sensor

were evaluated with respect to response time, detection limit, selectivity, and dependence on applied potential, thickness of Nafion membrane, ionic strength, temp. and **pH** as well as operating and storage stability. High sensitivity of the sensor with a detection limit of 0.5.mu.M was due to high efficiency of the electron communication between immobilized horseradish peroxidase and the **electrode** via new **methylene blue** N.

L75 ANSWER 35 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1997:4923 HCAPLUS
DN 126:128832
TI Reagentless **amperometric** glucose dehydrogenase biosensor based on electrocatalytic oxidation of NADH by osmium phenanthrolinedione mediator
AU Hedenmo, Maria; Narvaez, Arantzaez; Dominguez, Elena; Katakis, Ioanis
CS Departamento de Quimica Analitica, Universidad de Alcala, Madrid, E-28871, Spain
SO Analyst (Cambridge, U. K.) (1996), 121(12), 1891-1895
CODEN: ANALAO; ISSN: 0003-2654
PB Royal Society of Chemistry
DT Journal
LA English
AB The mediator Os(4,4'-dimethyl,2,2'-bipyridine)2(1,10-phenanthroline-5,6-dione) was used for the catalytic oxidn. and recycling of NADH. The mediator, with a **redox** potential of almost 0 V vs. **Ag/AgCl**, shows clear electrocatalysis of NADH at 0.1 V vs. **Ag/AgCl** at **pH** 6.0. Carbon paste **electrodes** modified with the mediator show a clear electrocatalytic wave reaching limiting current densities at 0.15 V vs. **Ag/AgCl** of the order of 140 .mu.A cm-2 I mmol-1 NADH. Reagentless dehydrogenase carbon past **amperometric electrodes** for glucose were developed, mixing the mediator, glucose dehydrogenase and NAD+ in the paste. These **electrodes** were optimized with respect to amts. of **enzyme**, mediator and NAD+ and were studied with a variety of electrochem. techniques. The results suggest that the response is limited by the **enzymic** step of the redn. of NAD+ or the oxidn. of the substrate. The glucose **electrodes** show max. current densities of >0.5 mA cm-2 and very good operational stability in continuous operation; under dry storage conditions their lifetime exceeded 1 mo.

L75 ANSWER 36 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1996:581827 HCAPLUS
DN 125:322105
TI Whole cell amperometric **biosensor** based on Aspergillus niger for determination of glucose with enhanced upper linearity limit
AU Katrlik, J.; Svorc, J.; Rosenberg, M.; **Miertus, S.**
CS Department of Analytical Chemistry, Slovak Technical University, Radlinskeho 9, 812 37, Bratislava, Slovakia
SO Anal. Chim. Acta (1996), 331(3), 225-232
CODEN: ACACAM; ISSN: 0003-2670
DT Journal
LA English
AB Whole cells of Aspergillus niger strain CCM 8004 contg. glucose oxidase (E.C. 1.1.3.4.) were used for the prepn. of a glucose **biosensor**. The microorganism was entrapped in a dialysis membrane attached to the Clark oxygen electrode. The upper linearity limit of the **sensor** was improved by the presence of hydrogen peroxide. At a concn. of H2O2 equal to 8mmoll-1 the upper linearity limit increased by 10 times without marked influence on the sensitivity of the **sensor**. Influences of pH and temp. on the **sensor** response were tested. The selectivity of the **biosensor** on various saccharides was evaluated and it was found that only maltose gives a response from tested saccharides. As to the operational and storage stability, a continuously used **sensor** lost 25% of its initial sensitivity after 20 days, the storage stability was at least two months. Because of good selectivity, the **sensor** has been used for the detn. of glucose

in whey (after hydrolysis of lactose) during fermn. of Xanthomonas campestris. A good correlation between data detd. by the enzymic kit as well as by liq. chromatog. with the whole cell amperometric **biosensor** was obtained.

L75 ANSWER 37 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1996:400005 HCAPLUS
DN 125:162413
TI Double electropolymer modified **platinum electrode** to follow the kinetic process H2O2 + ascorbic acid. Influence of the reaction on **amperometric** biosensor applications
AU Losito, Ilario; Zambonin, Carlo G.
CS Dipartimento di Chimica, Universita di Bari, Via E. Orabona 4, Bari, I-70126, Italy
SO J. Electroanal. Chem. (1996), 410(2), 181-187
CODEN: JECHES; ISSN: 0368-1874
DT Journal
LA English
AB A **Pt electrode** modified by a polypyrrole/poly(o-**phenylenediamine**) bilayer membrane able to entrap large mols. such as **glucose oxidase** was used to investigate (at 27.degree. and **pH** 7) the kinetics of ascorbic acid (AA) oxidn. by hydrogen peroxide (H2O2 + AA .fwdarw. 2 H2O + dehydroascorbic acid) by following the H2O2 concn. as a function of time. The largely unmatched rejection characteristics of this device towards AA permitted it to operate even in the presence of high AA/H2O2 ratios, e.g., 1000:1. Under these conditions, pseudo-first-order kinetic const. values ranging from 3.26 .times. 10-3 to 4.10 .times. 10-3 s-1 were obtained at [AA] = 2 mM and initial [H2O2] = 2 .mu.M. The potential influence of the above reaction on sensitivity and reliability of H2O2-detecting **biosensors** in the presence of AA is discussed critically, taking into account also the recent, and sometimes conflicting, literature views on the problem.
IT **9001-37-0D, Glucose oxidase**, immobilized
RL: ARG (Analytical reagent use); DEV (Device component use); RCT (Reactant); ANST (Analytical study); USES (Uses)
(electropolymer-modified **electrode** for ascorbate oxidn. by hydrogen peroxide in relation to **amperometric biosensors**)
IT **7440-06-4, Platinum**, analysis
RL: ARU (Analytical role, unclassified); DEV (Device component use); ANST (Analytical study); USES (Uses)
(electropolymer-modified **electrode** for ascorbate oxidn. by hydrogen peroxide in relation to **amperometric biosensors**)

L75 ANSWER 38 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1995:909202 HCAPLUS
DN 124:3730
TI Dual functionalities of 4-aminodiphenylamine in **enzymic** assay and mediated biosensor construction
AU Groom, Carl A.; Luong, John H. T.; Thatipalmala, Rama
CS Biotechnol. Res. Inst., Natl. Res. Council Canada, Montreal, PQ, H4P 2R2, Can.
SO Anal. Biochem. (1995), 231(2), 393-9
CODEN: ANBCA2; ISSN: 0003-2697
DT Journal
LA English
AB 4-Aminodiphenylamine (4-ADPA; N-phenyl-1,4-**phenylenediamine**, CAS 101-54-2) and its water-sol. HCl salt (CAS 2198-59-6) were demonstrated to be efficient mediators for **glucose oxidase**, lactate oxidase, xanthine oxidase, and lysine oxidase. Using cyclic voltammetry, single oxidative peak potentials were obsd. for scans ranging from 0 to 0.5 V vs. **Ag/AgCl**. The half-wave potential for both prepns. was 0.11 V vs. **Ag/AgCl** at **pH** 7 and decreased 59 mV per unit **pH** increase. Peak current data were

analyzed to est. diffusivities of 0.8 .times. 10-5 cm2/s for sol. 4-ADPA HCl, and 2.36 .times. 10-5 cm2/s for 4-ADPA solubilized in 2.5 mM 2-hydroxypropyl-.beta.-cyclodextrin. The overall second-order kinetic consts. (k) for the reaction of reduced **glucose oxidase** with oxidized 4-ADPA HCl and 4-ADPA in cyclodextrin were estd. to be 1.8 .times. 105 and 1.7 .times. 105 M-1 s-1, resp., using cyclic voltammetry measurements at varied scan rates and **enzyme** concns. Both prepns. proved to be suitable electron acceptors for horseradish peroxidase, as indicated by changes in absorbance spectra upon oxidn. or redn. The electrochem. and spectral behavior of the prepns. were applied in conjunction with **glucose oxidase** to devise mediated **amperometric** and hydrogen peroxide-coupled spectrophotometric assays for glucose. The results of both assays compared favorably with the hexokinase ref. method.

IT **9001-37-0, Glucose oxidase**
RL: ARG (Analytical reagent use); BAC (Biological activity or effector, except adverse); PEP (Physical, engineering or chemical process); ANST (Analytical study); BIOL (Biological study); PROC (Process); USES (Uses)
(electrochem. behavior and suitability of 4-aminodiphenylamine as a mediator for **biosensors** and **enzymic** assays)

IT **9001-37-0D, Glucose oxidase**, immobilized
RL: ARG (Analytical reagent use); PEP (Physical, engineering or chemical process); ANST (Analytical study); PROC (Process); USES (Uses)
(electrochem. behavior and suitability of 4-aminodiphenylamine as a mediator for **biosensors** and **enzymic** assays)

L75 ANSWER 39 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1995:713364 HCAPLUS
DN 123:106862
TI Micro **enzyme**-sensor with an osmium complex and porous carbon for measuring galactose
AU Miyata, Kazuhisa; Fujiwara, Masahiko; Motonaka, Junko; Moriga, Toshihiro; Nakabayashi, Ichiro
CS Dep. Chemical Sci. and Technology, Univ. Tokushima, Tokushima, 770, Japan
SO Bull. Chem. Soc. Jpn. (1995), 68(7), 1921-7
CODEN: BCSJA8; ISSN: 0009-2673
DT Journal
LA English
AB A micro **enzyme**-sensor, based on galactose oxidase (EC 1.2.3.9) and a tris(2,2'-bipyridine) complex of osmium (II/III) as a **redox** mediator ([Os(bpy)3]2+/3+), fabricated on a carbon **electrode** (25 .mu.m diam.), was developed for measuring galactose. To obtain the carbon **electrode**, a **platinum**-disk **electrode** (25 .mu.m diam.) was etched in hot aqua regia to create a cavity (depth of .apprx.3-5 .mu.m) at its tip. A porous carbon material was prepd. from 90% acetylene black and 10% Teflon emulsion as a binder, and then packed into the cavity of the **platinum**-disk **electrode**'s tip. The carbon **electrode** was immersed in the osmium complex with 0.1 mol dm-3 LiClO4 to adsorb it in the carbon pores, which was monitored based on an increase in the anodic peak current and the cathodic peak current based on the osmium complex **redox** potential by the cyclic voltammogram. The tip of the carbon **electrode** was dipped overnight in a buffer soln. of **pH** 7.00 contg. galactose oxidase to immobilize it on this surface by adsorption. The characteristics of the porous-carbon material surface by x-ray diffraction (x-ray diffraction) and SEM, the calibration curve for measuring of galactose, and the effects of the **pH**, temp. and concomitant compds. were investigated. By the x-ray diffraction measurement, the porous carbon after treating a Zonyl FSN fluoro-carbon surfactant soln., a 5% Nafion soln. with methanol, and an osmium complex with 0.1 mol dm-3 LiClO4 showed good crystallinity compared with carbon powder. The structure of the carbon-**electrode** surface was visually confirmed using SEM photographs. The carbon surface had many pores, and galactose oxidase existed on it after adsorption. Under the optimum conditions the **amperometric** response of this sensor was linear over concn. ranges of 0.01-5.00 mmol dm-3 galactose; the correlation coeff. was 0.999.

IT **7440-44-0**, Carbon, uses
RL: DEV (Device component use); USES (Uses)
(micro **enzyme** sensor with osmium complex and porous carbon for measuring galactose)

L75 ANSWER 40 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1995:628061 HCAPLUS
DN 123:159739
TI Solvent effects on the reactivities of an **amperometric** glucose sensor
AU Iwuoha, Emmanuel I.; Smyth, Malcolm R.; Lyons, Michael E. G.
CS School of Chemical Sciences, Dublin City University, Dublin, 9, Ire.
SO J. Electroanal. Chem. (1995), 390(1-2), 35-45
CODEN: JECHES; ISSN: 0368-1874
DT Journal
LA English
AB Reactivities of org. phase **biosensors** contg. 5.1 pmol cm-2 **glucose oxidase** (GOx) on **glassy carbon** (GC) or **Pt electrode** surfaces (0.071 cm2 in area) were evaluated in acetonitrile, acetone, butan-2-ol, THF and 0.1M phosphate buffer (**pH** 7.0). Each of the org. media contained 10% vol./vol. of water. Ferrocenemonocarboxylic acid was used as a sol. electron transfer mediator for the detection of glucose in these solvents. Tafel analyses of the cyclic voltammograms (CVs) of the electrocatalytic reaction gave Tafel slopes of between 103 and 129 mV decade-1, which are in good agreement with the theor. value of 118 mV decade-1. Const.-potential **amperometric** studies on GOx-modified rotating **Pt** disk **electrodes** (RDEs) were carried out at 0.45 V, a potential dictated by the limiting catalytic currents IK of the CV expts. The apparent turnover rate const. k'cat of GOx in the biosensor and its catalytic efficiency k'cat/K'm were estd. from the results of the RDE expts. Changing from the aq. buffer to org. media produced a drastic decrease in k'cat, which is more than two orders of magnitude lower in butan-2-ol. This sensor characteristic is related to the lower solvent-dependent diffusibility of glucose in the sensor for the org. systems vis-a-vis phosphate buffer. The normalized catalytic efficiencies, (k'cat/K'm)org solv/(k'cat/K'm)buffer show an enhancement of biosensor efficiency on changing from phosphate buffer to polar org. solvents. The k'cat/K'm values are indicators of the degree of activation of the biosensor's electrocatalytic reaction. Greater stabilization of the transition state of the electroenzymic process by org. phases relative to phosphate buffer was ascertained from the normalized catalytic efficiency. The enhanced catalytic efficiency of the org. phase sensors is attributed solely to the activation of the catalytic reaction of GOx and .beta.-D-glucose.
IT **7440-06-4, Platinum**, analysis
RL: ARU (Analytical role, unclassified); DEV (Device component use); ANST (Analytical study); USES (Uses)
(**electrodes**; solvent effects on reactivities of **amperometric** glucose sensor)
IT **7440-44-0**, Carbon, analysis
RL: ARU (Analytical role, unclassified); DEV (Device component use); ANST (Analytical study); USES (Uses)
(glassy; **electrodes**; solvent effects on reactivities of **amperometric** glucose sensor)
IT **9001-37-0, Glucose oxidase**
RL: ARG (Analytical reagent use); CAT (Catalyst use); DEV (Device component use); ANST (Analytical study); USES (Uses)
(solvent effects on reactivities of **amperometric** glucose sensor)

L75 ANSWER 41 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1995:24136 HCAPLUS
DN 122:122198
TI Permeation of solutes through an electropolymerized ultrathin poly-o-**phenylenediamine** film used as an **enzyme**-entrapping

membrane
AU Centonze, Diego; Malitesta, Cosimino; Palmisano, Francesco; Zambonin, Pier Giorgio
CS Dip. Chim., Univ. Bari, Bari, 70126, Italy
SO Electroanalysis (N. Y.) (1994), 6(5-6), 429-9
CODEN: ELANEU; ISSN: 1040-0397
DT Journal
LA English
AB Permeation of electroactive org. probes through an electroinactive and passivating poly-o-**phenylenediamine** (PPD) film electropolymd. on **Pt** and **glassy carbon** (GC) **electrodes** was studied by cyclic and rotating disk **electrode** (RDE) voltammetry. The access of solutes to the metal-polymer interface appears mainly governed by specific chem. interactions, influencing partition, and diffusion phenomena, rather than by exclusion effects based on mol. size or charge. Potential cycling of the film induces fine modifications in the chem./phys. structure of the polymer, as evidenced by electron spectroscopy for chem. anal. (ESCA) measurements and by an enhanced permeation of certain solutes. The membrane is, however, stable in the **pH** and potential range usually employed in its application, i.e., as an **enzyme**-entrapping membrane in **amperometric biosensors**; because of membrane permselectivity, the electrochem. response of the most common electroactive interferents is deeply depressed.
IT **7440-44-0**, Carbon, analysis
RL: ARU (Analytical role, unclassified); DEV (Device component use); ANST (Analytical study); USES (Uses)
(**electrode** of glassy; permeation of solutes through electropolymd. ultrathin poly-o-**phenylenediamine** film used as **enzyme**-entrapping membrane in relation to)
IT **7440-06-4**, **Platinum**, analysis
RL: ARU (Analytical role, unclassified); DEV (Device component use); ANST (Analytical study); USES (Uses)
(**electrode**; permeation of solutes through electropolymd. ultrathin poly-o-**phenylenediamine** film used as **enzyme** -entrapping membrane in relation to)
IT **95-54-5**, o-**Phenylenediamine**, analysis
RL: ANT (Analyte); PRP (Properties); ANST (Analytical study)
(voltammetric study of permeation of solutes through electropolymd. ultrathin poly-o-**phenylenediamine** film used as **enzyme** -entrapping membrane)

L75 ANSWER 42 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1994:599868 HCAPLUS
DN 121:199868
TI **Amperometric** biosensor based on carbon paste mixed with **enzyme**, lipid and cytochrome c
AU Amine, A.; Deni, J.; Kauffmann, J-M.
CS Universite Libre de Bruxelles, Institut de Pharmacie, Campus Plaine, CP 205/6 - 1050 Brussels, Belg.
SO Bioelectrochem. Bioenerg. (1994), 34(2), 123-8
CODEN: BEBEBP; ISSN: 0302-4598
DT Journal
LA English
AB The electrochem. behavior of horse heart cytochrome c has been investigated at several lipid-contg. carbon paste **electrodes** (CPEs). Cytochrome c showed no electroactivity in the CPE but its **redox** behavior was obsd. when the CPE contained judiciously selected lipids. Rapid electron transfer was obtained by incorporating neg. charged lipids into the **electrode** matrix. A reagentless L-lactate CPE modified with cytochrome c, asolectin and lactate dehydrogenase (cytochrome b2) was developed. The biosensor operated at low potentials (+0.15 V/SCE), avoiding the interference from ascorbate and urate ions. The detn. of L-lactate was made in the concn. range 1 .mu.M-10 mM. After 5 wk of storage in phosphate buffer (**pH** 7.4) at 4.degree., 30% of the original sensor response remained.

IT **7440-44-0**, Carbon, uses
RL: DEV (Device component use); USES (Uses)
(**amperometric** biosensor **electrode** based on carbon paste mixed with **enzyme**, lipid and cytochrome c)

L75 ANSWER 43 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1994:49367 HCAPLUS
DN 120:49367
TI Whole cell Aspergillus niger **biosensor** for determination of glucose
AU Svorc, J.; Katrlik, J.; **Miertus, S.**
CS Dep. Anal. Chem., Slovak Tech. Univ., Bratislava, 812 37, Slovakia
SO Proc. Conf. Trends Electrochem. Biosens. (1992), 181-91. Editor(s): **Costa, Giacomo; Miertus, Stanislav**. Publisher: World Sci., Singapore, Singapore.
CODEN: 59NPAY
DT Conference
LA English
AB Whole cells of Aspergillus niger strain CCM 8004 as a source of glucose oxidase (E.C.1.1.3.4) were used for the prepn. of a glucose **biosensor**. The microorganism was entrapped on the Clark O electrode by a dialysis membrane. The influence of pH and temp. on the **sensor** response was tested. The upper linearity limit of the **sensor** was improved by the effect of hydrogen peroxide. At 8 mmol H2O2/L the upper linearity limit increased by 10 times without marked influence on the sensitivity of the **sensor**. Also, the selectivity of the **biosensor** for various saccharides was tested. The **sensor** was used for the detn. of glucose in whey (after hydrolysis of lactose) during fermn. of Xanthomonas campestris. A good correlation between photometric and **biosensor** data was obtained ($r = 0.96$ for 12 samples).

L75 ANSWER 44 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1994:49366 HCAPLUS
DN 120:49366
TI Electrochemistry of enzyme **sensors** and their use in life sciences
AU Botre, Francesco; Botre, Claudio
CS Fac. Econ. Commercio, Univ. "La Sapienza", Rome, 00161, Italy
SO Proc. Conf. Trends Electrochem. Biosens. (1992), 107-25. Editor(s): **Costa, Giacomo; Miertus, Stanislav**. Publisher: World Sci., Singapore, Singapore.
CODEN: 59NPAY
DT Conference
LA English
AB Electrochem. **biosensors** have already been extensively used for the anal. detn. of several chem. species both inside and outside the human body. This contribution reports data derived from the application of several electrochem. **biosensors** to the study of biochem. and biophys. interactions in model systems reproducing the physiol. conditions.

L75 ANSWER 45 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1994:49365 HCAPLUS
DN 120:49365
TI Construction of electrochemical **biosensors**: coupling techniques and surface interactions of proteins and nucleic acids on electrode surfaces
AU Pittner, F.; Mann-Buxbaum, E.; Hawa, G.; Schalkhammer, T.; Ogunyemi, E. O.
CS Inst. Allgemeine Biochem., Ludwig Boltzmann Forschungsstelle Biochem., Vienna, 1090, Austria
SO Proc. Conf. Trends Electrochem. Biosens. (1992), 69-84. Editor(s): **Costa, Giacomo; Miertus, Stanislav**. Publisher: World Sci., Singapore, Singapore.
CODEN: 59NPAY
DT Conference; General Review

LA English
AB Electrochem. **biosensor** construction, esp. coupling techniques and surface interactions of proteins and nucleic acids on electrode surfaces, is discussed.

L75 ANSWER 46 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1994:49364 HCAPLUS
DN 120:49364
TI Recent advances in **biosensors**
AU Tamiya, Eiichi; Karube, Isao
CS Res. Cent. Adv. Sci. Technol., Univ. Tokyo, Tokyo, 153, Japan
SO Proc. Conf. Trends Electrochem. Biosens. (1992), 1-12. Editor(s): **Costa, Giacomo; Miertus, Stanislav**. Publisher: World Sci., Singapore, Singapore.
CODEN: 59NPAY
DT Conference; General Review
LA English
AB Micromachining techniques were applied to construct **biosensor** systems. The micromachined **biosensors** have small size, low prodn. cost and good reproducibility. An electrochem. flow cell and an immobilized enzyme column were integrated onto the same chip. Carbon fiber electrodes are used to construct ultramicro-**biosensors** with 7 .mu.m diam. The detn. limit was 0.1 .mu.M of hydrogen peroxide. A micro-acetylcholine **sensor** was fabricated by immobilizing acetylcholine esterase and choline oxidase on the carbon fiber by entrapment with PVA-SbQ (polyvinyl alc.-styrylpyridinium). This **sensor** gave a linear calibration plot for the range 0.1-1.0 mM with a linear correlation coeff. of 0.9842. A micro-glutamate **sensor** consists of a platinized carbon fiber disk electrode modified with immobilized glutamate oxidase membrane. This **sensor** gave a linear calibration for the range 2 .mu.M-1.2 mM. Release of glutamate in the cerebellar cortex was detected after potassium and elec. stimulation. Novel microbial sensing systems were developed utilizing luminous bacteria and recombinant E. coli contg. luciferase genes. Environmental pollutants like pesticides and mutagenic compds. were monitored by these systems.

L75 ANSWER 47 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1994:49143 HCAPLUS
DN 120:49143
TI Plant-tissue electrode for the determination of ascorbic acid
AU Lorenti, Giampiero; Mazzei, Franco; Polati, Paola; Porcelli, Fernando; Botre, Francesco; Vinci, Giuliana
CS Dip. Stud. Chim. Tecnol. Sost. Biologicamente Attive, Univ. "La Sapienza", Rome, 00185, Italy
SO Proc. Conf. Trends Electrochem. Biosens. (1992), 171-9. Editor(s): **Costa, Giacomo; Miertus, Stanislav**. Publisher: World Sci., Singapore, Singapore.
CODEN: 59NPAY
DT Conference
LA English
AB This work presents a new electrochem. **biosensor** for the direct detn. of ascorbic acid aq. samples. The **biosensor** consists of an amperometric Clark-O2 electrode and a biocatalytic membrane of feijoa (Feijoa sellowiana) tissue, rich in the enzyme ascorbate oxidase (E.C. 1.10.3.3). The **biosensor**, which is extremely easy to prep. and to use, is endowed with an extended range of linearity of the response (over two decades of ascorbic acid concn.) and a remarkable reproducibility of results. A comparison between this plant tissue electrode and a classic ascorbic acid **biosensor** prepd. by immobilizing a suitable amt. of purified ascorbic oxidase on a preactivated membrane, is given in terms of sensitivity, selectivity, reliability and reproducibility of the exptl. results, time, ease and cost of operation. Some applications of the **biosensor** for the quant. detn. of ascorbic acid in food, beverage, and pharmaceutical formulations are also presented.

L75 ANSWER 48 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1994:49142 HCAPLUS
DN 120:49142
TI Influence of the enzymic membrane on the analytical performance of amperometric glutamic acid **biosensors**.
AU Mazzei, Franco; Botre, Claudio; Lorenti, Giampiero; Botre, Francesco; Porcelli, Fernando; Scibona, Giancarlo
CS Dip. Stud. Chim. Tecnol. Sost. Biologicamente Attive, Univ. "La Sapienza", Rome, 00185, Italy
SO Proc. Conf. Trends Electrochem. Biosens. (1992), 163-70. Editor(s): **Costa, Giacomo; Miertus, Stanislav**. Publisher: World Sci., Singapore, Singapore.
CODEN: 59NPAY
DT Conference
LA English
AB To study the influence of the biocatalytic membrane on the anal. performance of amperometric H2O2-sensing glutamic acid oxidase-based **biosensors**, six different enzymic membranes have been prepd. The main features of the corresponding **biosensors** have been evaluated, compared and discussed in the present work.

L75 ANSWER 49 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1994:49102 HCAPLUS
DN 120:49102
TI Exploiting bioassay techniques in the development of **biosensors** for environmental protection
AU Rawson, David M.; Richardson, Nathan J.
CS Luton Coll. Higher Educ., Luton/Bedfordshire, UK
SO Proc. Conf. Trends Electrochem. Biosens. (1992), 127-34. Editor(s): **Costa, Giacomo; Miertus, Stanislav**. Publisher: World Sci., Singapore, Singapore.
CODEN: 59NPAY
DT Conference; General Review
LA English
AB A review, with 11 refs., discussing the operation and applications of **biosensors** in the monitoring of the environment. Special attention is given to the applications in monitoring water quality.

L75 ANSWER 50 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1994:49101 HCAPLUS
DN 120:49101
TI **Biosensors** for in vivo monitoring
AU Mascini, M.
CS Dip. Sanita' pubblica Chim. Anal. Ambientale, Univ. Firenze, Florence, 50121, Italy
SO Proc. Conf. Trends Electrochem. Biosens. (1992), 85-105. Editor(s): **Costa, Giacomo; Miertus, Stanislav**. Publisher: World Sci., Singapore, Singapore.
CODEN: 59NPAY
DT Conference; General Review
LA English
AB A review, with 21 refs., describing major advancements in **biosensors** in three areas of interest in medicine, namely clin. chem., ex vivo monitoring and in vivo monitoring.

L75 ANSWER 51 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1994:26619 HCAPLUS
DN 120:26619
TI Screen printing technology - a tool for mass production of enzyme electrodes
AU Bilitewski, U.
CS Dep. Enzyme Technol., Ges. Biotechnol. Forsch. mbH, Braunschweig, W-3300, Germany
SO Proc. Conf. Trends Electrochem. Biosens. (1992), 59-68. Editor(s): **Costa, Giacomo; Miertus, Stanislav**. Publisher: World Sci.,

Singapore, Singapore.
CODEN: 59NPAY
DT Conference
LA English
AB This article demonstrates that thick film technol., which is a well-established technol. for the mass-prodn. of electronic hybrids and which was introduced to the field of **sensor** development, is a suitable technol. for the prodn. of **biosensors**. The described **biosensors** are mainly applied to the detn. of enzyme substrates in food, but there is the possibility to detect enzyme inhibitors as well.

L75 ANSWER 52 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1994:26588 HCAPLUS
DN 120:26588
TI **Biosensors** for environmental analysis
AU Campanella, Luigi
CS Dip. Chim., Univ. Roma "La Sapienza", Rome, 00185, Italy
SO Proc. Conf. Trends Electrochem. Biosens. (1992), 135-45. Editor(s): **Costa, Giacomo; Miertus, Stanislav.** Publisher: World Sci., Singapore, Singapore.
CODEN: 59NPAY
DT Conference; General Review
LA English
AB This review, with 44 refs., discusses various types of **biosensors** for environmental monitoring.

L75 ANSWER 53 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1994:26587 HCAPLUS
DN 120:26587
TI Colloidal gold as an enzyme immobilization matrix for electrochemical **biosensors**
AU Crumbliss, A. L.; Perine, S. C.; Stonehuerner, J.; Tubergen, K. R.; Henkens, R. W.; Zhao, J.; O'Daly, J. P.
CS Dep. Chem., Duke Univ., Durham, NC, 27706, USA
SO Proc. Conf. Trends Electrochem. Biosens. (1992), 43-58. Editor(s): **Costa, Giacomo; Miertus, Stanislav.** Publisher: World Sci., Singapore, Singapore.
CODEN: 59NPAY
DT Conference; General Review
LA English
AB A review, with 38 refs. Examples are used to illustrate the efficacy of colloidal gold particles as an immobilization matrix for enzymes. A second immobilization matrix is also presented, carrageenan hydrogel, that can be used in conjunction with colloidal gold.

L75 ANSWER 54 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1994:26586 HCAPLUS
DN 120:26586
TI Horseradish peroxidase: a versatile enzyme for amperometric **biosensors**
AU Cass, Anthony E. G.; Smit, Mark H.
CS Cent. Biotechnol., Imp. Coll. Sci. Technol. Med., South Kensington/London, SW7 2AY, UK
SO Proc. Conf. Trends Electrochem. Biosens. (1992), 25-42. Editor(s): **Costa, Giacomo; Miertus, Stanislav.** Publisher: World Sci., Singapore, Singapore.
CODEN: 59NPAY
DT Conference; General Review
LA English
AB A review, with 42 refs. The properties and structure of horseradish peroxidase are discussed with emphasis on its applications in the field of amperometric **biosensors**.

L75 ANSWER 55 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1994:2689 HCAPLUS
DN 120:2689

TI Development of amperometric **biosensors** for organophosphate and carbamate pesticides
AU Skladal, Petr
CS Dep. Biochem., Masaryk Univ., Brno, 611 37, Czech Rep.
SO Proc. Conf. Trends Electrochem. Biosens. (1992), 201-8. Editor(s): **Costa, Giacomo; Miertus, Stanislav**. Publisher: World Sci., Singapore, Singapore.
CODEN: 59NPAY
DT Conference
LA English
AB The pesticide **biosensor** was constructed as a disposable strip contg. a cobalt phthalocyanin modified carbon composite electrode and a crosslinked cholinesterase layer. With butyrylthiocholine as substrate, enzymically produced thiocholine was oxidized at +250 mV. The steady state current was used as measure of enzyme activity. In the presence of pesticides, an irreversible inhibition of cholinesterase occurred resulting in decrease of current. The enzyme loading in the **sensor** reaction layer was optimized. A simple model of the **biosensor** function was proposed and tested. Detection limit for paraoxon was 0.30 nmol/L, the time of anal. being <6 min.

L75 ANSWER 56 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1992:644760 HCAPLUS
DN 117:244760
TI **Amperometric biosensors** based on an apparent direct electron transfer between **electrodes** and immobilized peroxidases
AU Gorton, Lo; Joensson-Pettersson, Gunilla; Csoregi, Elisabeth; Johansson, Kristina; Dominguez, Elena; Marko-Varga, Gyorgy
CS Dep. Anal. Chem., Univ. Lund, Lund, S-221 00, Swed.
SO Analyst (London) (1992), 117(8), 1235-41
CODEN: ANALAO; ISSN: 0003-2654
DT Journal
LA English
AB An apparent direct electron transfer between various **electrode** materials and peroxidases immobilized on the surface of the **electrode** has been reported in the last few years. An electrocatalytic redn. of hydrogen peroxide starts at about +600 mV vs. a satd. **calomel** (ref.) **electrode** (SCE) at neutral **pH**. The efficiency of the electrocatalytic current increases as the applied potential is made more neg. and starts to level off at about -200 mV vs. SCE. **Amperometric biosensors** for hydrogen peroxide can be constructed with these types of peroxidase modified **electrodes**. By co-immobilizing a hydrogen peroxide-producing oxidase with the peroxidase, **amperometric biosensors** can be made that respond to the substrate of the oxidase within a potential range essentially free of interfering electrochem. reactions. Examples of glucose, alc. and amino acid sensors are shown.
IT **7440-44-0**
RL: ANST (Analytical study)
(carbon fibers, graphite, hydrogen peroxidase immobilized on Polycarbon LGR, in hydrogen peroxide **amperometric** sensor for anal.)
IT **7440-44-0**
RL: ANST (Analytical study)
(carbon fibers, hydrogen peroxidase immobilized on, in hydrogen peroxide **amperometric** sensor for anal.)
IT **9001-37-0, Glucose oxidase**
RL: ANST (Analytical study)
(glucose **amperometric** sensor contg. coimmobilized peroxidase and, for anal.)

L75 ANSWER 57 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1991:243889 HCAPLUS
DN 114:243889
TI **Amperometric** biosensor for use in organic solvents
IN Spohn, Uwe; Miethe, Peter; Voss, Harald
PA Martin-Luther-Universitaet Halle-Wittenberg, Ger. Dem. Rep.

SO Ger. (East), 6 pp.
CODEN: GEXXA8
DT Patent
LA German
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DD 278873	A1	19900516	DD 1988-324044	19881227

AB The title biosensor consists of a permeable support system (e.g. a polymer membrane or paper), an **amperometric** signal transducer, and between these a thin catalyst layer comprising a **biocatalyst** (**enzyme, enzyme**-labeled protein, **cells**, organelles, etc.) in a lyotropic mesophase which is insol. in, and chem. and phys. stable towards, the org. solvent. The mesophase consists of a ternary or pseudoternary surfactant/org. solvent/water system, where the org. solvent is immiscible with water. Thus, a biosensor comprised (1) a 3-**electrode** system consisting of an **Ag/AgCl** ref. **electrode**, an **Ag/AgCl** counter **electrode**, and a graphite indicator **electrode** in elec. contact with (2) a lyotropic mesophase 0.05-0.15 mm thick composed of polyoxyethylene 7-nonylphenyl ether 8.55, n-hexane 76.84, NAD 0.13, yeast alc. dehydrogenase 0.05 wt.%, and 0.1M phosphate buffer (**pH** 7.5-8.0) contg. the **redox** mediator K .beta.-naphthoquinone-4-sulfonate (0.11 mg/mL), and (3) a porous PTFE membrane in contact with the org. solvent contg. the analyte (C2-15 aliph. alc.). A polarization of +0.06V was applied between the indicator and ref. **electrodes**. The current measured was related to the alc. concn. over the range 0.1-10 mM.

L75 ANSWER 58 OF 58 HCAPLUS COPYRIGHT 2001 ACS
AN 1990:451839 HCAPLUS
DN 113:51839
TI Hybrid **biosensor** for the determination of lactose
AU Svorc, Jozef; **Miertus, Stanislav**; Barlikova, Alena
CS Dep. Anal. Chem., Slovak Tech. Univ., Bratislava, 812 37, Czech.
SO Anal. Chem. (1990), 62(15), 1628-31
CODEN: ANCHAM; ISSN: 0003-2700
DT Journal
LA English
AB Genetically manipulated bacteria Escherichia coli K-12 recombinant PQ-37 and glucose oxidase (EC 3.2.1.3) were used for the construction of a hybrid amperometric lactose **sensor** because of the hyperprodn. of .beta.-galactosidase (EC 3.2.1.23) by E. coli effected by a genotoxic agent. The biocatalytic layer was prepd. by coimmobilization of the E. coli cells with glucose oxidase on the Nylon network via glutardialdehyde and fixed to the Clark oxygen electrode. The influence of pH, temp., and concn. of activators of .beta.-galactosidase on the **sensor** response was tested. Analyses of milk products were completed without any special pretreatment of the samples. The contents of lactose detd. by using the hybrid **sensor** agree with conventional photometric measurements. The relative std. deviation is less than 3% for all samples. The half-life of operational stability is 30 days.

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L108 ANSWER 1 OF 29 WPIX COPYRIGHT 2001 DERWENT INFORMATION LTD
AN 2001-427391 [46] WPIX
DNC C2001-129495
TI Solid matrix **biosensor** of high stability - NoAbstract.
DC J04
IN KATRLIK, J; **MIERTUS, S; PIZZARIELLO, A;**
STREDANSKI, M; SVORC, J
PA (SAIC-N) SAICOM SRL
CYC 1
PI IT 1291987 B 19990125 (200146)* C12Q000-00
ADT IT 1291987 B IT 1997-MI1216 19970523
PRAI IT 1997-MI1216 19970523
IC ICM C12Q000-00
FS CPI
FA NOAB
MC CPI: J04-B01

L108 ANSWER 2 OF 29 WPIX COPYRIGHT 2001 DERWENT INFORMATION LTD
AN 2001-211075 [21] WPIX
DNN N2001-150816 DNC C2001-062713
TI Printed circuit board **biosensor** for detecting microorganisms, includes a bioreporter linked to working **electrode**, capable of generating electrochemical signal upon recognizing a target molecule.
DC B04 D13 D15 D16 **J04** S03
IN MORENO, M; O'DALY, J P; SUNDSETH, R; WOJCIECHOWSKI, M
PA (ANDC-N) ANDCARE INC
CYC 87
PI WO 2001011080 A1 20010215 (200121)* EN 52p C12Q001-68 <--
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL OA PT SD SE SL SZ UG ZW
W: AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CR CU CZ DE DK EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG US UZ VN YU ZA ZW
AU 9952538 A 20010305 (200130) C12Q001-68 <--
ADT WO 2001011080 A1 WO 1999-US17620 19990804; AU 9952538 A AU 1999-52538 19990804, WO 1999-US17620 19990804
FDT AU 9952538 A Based on WO 200111080
PRAI WO 1999-US17620 19990804
IC ICM **C12Q001-68**
ICS **C12Q001-00; C12Q001-26; C12Q001-28;**
C12Q001-42; G01N027-327; G01N033-543
AB WO 200111080 A UPAB: 20010418
NOVELTY - A printed circuit board **biosensor** (I) (110) comprises a printed circuit board (315) including a working **electrode** (E1) (310) and a **reference electrode** (E2) (305) on it, and a bioreporter operably linked to E1 and capable of generating an electrochemical signal upon recognizing a target molecule to be detected in a sample, when subjected to an electrical potential applied across E1 and E2.
DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:
(1) an apparatus (II) comprising (I);
(2) a system (III) for detecting a target molecule in a sample, comprising (I) or (II), and an electrochemical signal detector, for detecting the signal when a potential is applied across E1 and E2; and

(3) a kit comprising (I), (II) or (III), and instructions for use.

USE - (I) is useful in the manufacture of an apparatus for detecting a target molecule in a sample. (I), (II), (III) and the kit comprising these, are useful in detecting a microorganism such as a pathogenic microorganism selected from a bacterium, fungus, yeast, virus, prion and eukaryotic microorganism, or a selected polynucleotide sequence such as a gene, nucleotide polymorphism, mRNA, antisense sequence, ribozyme, expressed sequence tag, vector, plasmid or cDNA (claimed).

ADVANTAGE - The **biosensor** is suitable for a more rapid, less labor intensive and cost effective clinical assays for the detection and identification of diseases and disorders affecting mankind as well as field portable assays. The apparatus is suitable for selective, rapid and sensitive electrochemical detection of nucleic acids that are found in bacteria, virus, parasites or other microbes.

DESCRIPTION OF DRAWING(S) - The figure shows the structure of the **biosensor**.

Biosensor 110

Reference electrode 305

Working **electrode** 310

Printed circuit board 315

Dwg.3/7

FS CPI EPI

FA AB; GI; DCN

MC CPI: B04-B03C; B04-B04C2; B04-C01; B04-E01; B04-E07; B04-F01; B04-G01; B04-K01; B04-L03A; B04-L03B; B04-L05A; B11-C08E; B12-K04; D03-K03; D03-K04; D04-A01H; D05-A02; D05-H04; D05-H05; D05-H06; D05-H12; D05-H12F; **J04-B01**

EPI: S03-E03C; S03-E14H4

TECH UPTX: 20010418

TECHNOLOGY FOCUS - INSTRUMENTATION AND TESTING - Preferred Apparatus: (I) further comprises a second working **electrode** and a second **reference electrode**. The printed circuit board further includes a second bioreporter operably linked to a second working **electrode** and is capable of generating a second electrochemical signal upon specifically recognizing a second target molecule to be detected in a sample, when subjected to second electrical potential applied across the second working and **reference electrodes**. The first and second target molecules are present within in a single sample or in distinct samples. The first and second electrical potentials are applied in parallel. The first and second bioreporters are capable of specifically recognizing a single target molecule. The bioreporter is operably linked to a working **electrode** by adsorption, crosslinking, covalent bonding or charge-charge interaction. The bioreporter comprises an antigen, peptide, polypeptide, nucleic acid or an electroactive molecule. The nucleic acid is a ribozyme, oligonucleotide, DNA, RNA or a peptide nucleic acid. The polypeptide is an antigen, antibody, receptor, or an enzyme. The bioreporter is an oxidase, peroxidase or **phosphatase**. The printed circuit board further defines a sample well. (I) further comprises a diffusible coating such as avidin, streptavidin or neutravidin, on working **electrode**. The **electrode** is a carbon **electrode** which further comprises a metal such as **gold**, **silver**, **platinum**, iridium, **mercury** or palladium. The metal is preferably in colloidal form. The **electrodes** are formed upon printed circuit board by deposition or electroplating. The printed circuit board further includes a sample well defined by at least one of the printed circuit board substrate and E1 and E2. The printed circuit boards further comprises a counter **electrode**. The target molecule is a peptide, polypeptide or nucleic acid. The electrochemical signal is detected by pulsed electrochemical detection (PED) including intermittent pulse **amperometry**, differential pulse **amperometry** or intermittent differential **amperometry**. (III) further comprises a device for applying electrical potential, and a programmed processor. The electrochemical signal detector also comprises a programmed processor.

L108 ANSWER 3 OF 29 WPIX COPYRIGHT 2001 DERWENT INFORMATION LTD
AN 2000-514965 [46] WPIX
DNC C2000-153686
TI **Amperometric biosensor**, useful e.g. for diagnosis, comprises **biocatalyst** that interacts with analyte, **pH** sensitive **redox** compound and **electrodes**.
DC B04 D16 **J04**
IN **MIERTUS, S; PIZZARIELLO, A; STREDANSKA, S; STREDANSKY, M**
PA (SAIC-N) SAICOM SRL
CYC 91
PI WO 2000046393 A1 20000810 (200046)* EN 35p C12Q001-00 <--
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL OA PT SD SE SL SZ TZ UG ZW
W: AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CR CU CZ DE DK DM EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
AU 2000025426 A 20000825 (200059) C12Q001-00 <--
EP 1151134 A1 20011107 (200168) EN C12Q001-00 <--
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI
ADT WO 2000046393 A1 **WO 2000-EP455 20000121**; AU 2000025426 A AU 2000-25426 20000121; EP 1151134 A1 EP 2000-903603 20000121, **WO 2000-EP455 20000121**
FDT AU 2000025426 A Based on WO 200046393; EP 1151134 A1 Based on WO 200046393
PRAI IT 1999-MI210 19990204
IC ICM **C12Q001-00**
AB WO 200046393 A UPAB: 20000921
NOVELTY - **Amperometric biosensor** (A) comprising at least one **biocatalyst** (I) that produces a **pH** change by interaction with an analyte, at least one **pH** sensitive compound (II), and working and **reference electrodes**, connected through an ammeter, is new.

DETAILED DESCRIPTION - **Amperometric biosensor** (A) comprising at least one **biocatalyst** (I) that produces a **pH** change by interaction with an analyte, at least one **pH** sensitive compound (II), and working and **reference electrodes**, connected through an ammeter, is new. (II) are cyclic 4-30C hydrocarbons substituted by at least one of hydroxy, thiol, primary amino, oxo, thioxo, =NH, OR1, SR1, NHR1. NR1R2 or =NR1, where R1 and R2 are optionally substituted hydrocarbyl, or 3-30C heterocycles containing at least one nitrogen, sulfur, oxygen, selenium, tellurium, boron, phosphorus, arsenic, antimony or silicon as heteroatom, optionally substituted by the same groups as the hydrocarbons.

An INDEPENDENT CLAIM is also included for detection of an analyte using (A).

USE - (A) is used for **amperometric** detection of a wide range of analytes, such as urea, glucose, lipids, hemoglobin, and pencillin, and inhibitors of (I), for human or veterinary diagnosis, in industrial processes, in the agriculture/food and pharmaceutical industries and for environmental monitoring (claimed).

ADVANTAGE - (A) provide accurate detection of many analytes. Compared with known **biosensors**, they have better detection limits (typically 0.1-10 micro M), linearity of output signal, rapidity of response, selectivity and stability, and they are simple to make in a wide range of shapes. The sensitivity is 0.1-5 micro A/mM/cm2.

Dwg.0/16
FS CPI
FA AB; DCN
MC CPI: B02-P02; B04-B01B; B04-B04D2; B04-C03D; B04-E01; B04-F01; B04-L01; B04-N04; B06-A03; B06-F03; B10-A07; B10-A13C; B11-C08B; B11-C08E; D05-A02A; D05-H09; **J04-B01**
TECH UPTX: 20000921
TECHNOLOGY FOCUS - INSTRUMENTATION AND TESTING - Preferred
Biocatalysts: The **biocatalyst** is selected from enzymes,

synzymes, cells (or components), tissues, immunoproteins, nucleic acids or their extracts, fractions, fragments, homogenates and lysates.
Preferred Compounds: The **redox** compounds are monomers. oligomers or polymers.
Preferred **Electrodes**: The working **electrode** is a solid composite, **platinum**, **gold**, **mercury** or **glassy carbon**, and the **reference electrode** is **silver/silver chloride** or **calomel**, preferably a composite working **electrode** is used that incorporates (I). (II) may also be present in the **electrode** or solution.
Preferred Process: The **electrodes** are placed in a measuring solution and a background current measured under a suitable potential. A sample is then added to the solution and the change in current, proportional to analyte concentration, recorded and optionally corrected for the change in current measured similarly using a blank **electrode**. In cases where the analyte inhibits (I), the background current is measured in presence of the substrate of (I).

TECHNOLOGY FOCUS - BIOLOGY - Preferred Enzyme: This is a **hydrolase**, **oxidoreductase**, **transferase**, **lyase**, **ligase**, **phosphorylase**, **decarboxylase**, **esterase**, **phosphatase** or **deaminase**.

TECHNOLOGY FOCUS - ORGANIC CHEMISTRY - Preferred Compound: The **redox** compound is a **pH** indicator, phenoxazine or phenothiazine dye or natural antioxidant, e.g. **hematoxylin**, **hematein**, **methylene blue**, **quercitin**, **flavonoids**, alkyl **gallates** or polymerized o- or p-**phenylene diamine**.

L108 ANSWER 4 OF 29 WPIX COPYRIGHT 2001 DERWENT INFORMATION LTD
AN 2000-136084 [12] WPIX
CR 1992-080072 [10]; 1996-361328 [36]; 1997-225429 [20]; 1998-494772 [42]; 1999-069659 [06]; 2000-037078 [03]; 2000-115881 [10]
DNC C2000-041603
TI A **biosensor** comprising a crosslinked protein crystal is useful for detecting the presence of a substance in a sample.
DC A41 B04 D13 D15 D16 E16 **J04**
IN NAVIA, M A; ST CLAIR, N L
PA (VERT-N) VERTEX PHARM INC
CYC 1
PI US 6004768 A 19991221 (200012)* 50p C12Q001-34 <--
ADT US 6004768 A CIP of US 1990-562280 19900803, CIP of US 1991-720237 19910624, CIP of US 1992-864424 19920406, Cont of US 1993-17510 19930212, US 1995-484238 19950607
FDT US 6004768 A Cont of US 5618710
PRAI US 1993-17510 19930212; US 1990-562280 19900803; US 1991-720237 19910624; US 1992-864424 19920406; US 1995-484238 19950607
IC ICM **C12Q001-34**
ICS C12M001-34; C12N009-14; C12N011-00
AB US 6004768 A UPAB: 20000308
NOVELTY - A **biosensor** for detecting an analyte of interest in a fluid comprises a protein crystal crosslinked with a multifunctional crosslinking agent, a retaining means and a signal transducer.
DETAILED DESCRIPTION - A **biosensor** for detecting an analyte of interest in a fluid comprises:
(1) a protein crystal crosslinked with a multifunctional crosslinking agent which has resistance to exogenous proteolysis so that the crosslinked protein crystal retains at least 91% of its stability, measured in terms of its degradation after incubation for 3 hours in the presence of a concentration of Pronase(TM) that causes the soluble crosslinked form of the protein to lose at least 94% of its stability, measured in terms of degradation under the same conditions where the protein has the activity of acting on the analyte of interest or on a reactant in a reaction which the analyte of interest participates;

(2) a retaining means for the crosslinked protein crystal consisting of a material which allows contact between the crosslinked protein crystal and a fluid which contains either the analyte on which the protein acts or a reactant in a reaction in which the analyte participates; and

(3) a signal transducer which produces a signal in the presence of the analyte.

An INDEPENDENT CLAIM is also included for an extracorporeal device which is used for altering a component of a fluid comprising a protein crystal, retaining means and signal transducer as above.

USE - The extracorporeal device is used for altering heparin, methotrexate, bilirubin, amino acids, urea or ammonia levels in a fluid.

The **biosensor** is used to detect the presence of a substance in a sample (claimed) and to remove substances from a sample. The sample can be a biological sample, water or other sample. It can also be used to catalyze the production of a selected product by altering a single substrate or combining the substrate with an additional substance or substances.

ADVANTAGE - The crosslinked enzyme crystals do not require a separate, inert support structure so substrate and product diffusion properties are improved and enzyme concentrations are provided which are close to the theoretical packing limit for the molecules, giving increased effective activity, reduction in substrate contact time with enzymes and reductions in plant size and capital costs. The enzyme can be used in harsh conditions e.g. elevated temperature, aqueous, organic or near-anhydrous solvents which was not possible with conventional immobilized enzyme systems.

Dwg.0/19

FS CPI

FA AB; DCN

MC CPI: A01-E04; A01-E09; B04-B04L; B04-L01; B04-N04B; B11-C08E3; B12-K04A; B12-K04E; D03-F; D04-A01J; D04-B04; D05-A01A; D05-A01B3; D05-C; D05-H09; E01; E05-G07; E06-D09; E07-A02H; E07-D09C; E10-A07; E10-A13B2; E10-B02D; E10-C02D2; E10-C04D4; E10-C04J1; E10-C04J2; E10-E04L2; E11-Q03; E31-F05; E31-H05; E31-K05; E31-N05C; J04-B01B

TECH UPTX: 20000308

TECHNOLOGY FOCUS - BIOLOGY - Preferred Protein: The protein crystal is preferably an enzyme crystal but can also be an antibody. The enzyme is a **hydrolase**, preferably a lipase, **esterase**, thermolysin, asparaginase, lyzozyme or **urease**. The crystal is a microcrystal which has a cross-section of 10-1 mm or less.

Preferred **Biosensor**: The **biosensor** also comprises **pH** electrodes, light sensing devices, heat sensing devices or means for detecting electrical charge to detect the activity of the protein or enzyme on the analyte or reactant.

Preferred Analyte: The analyte is glucose, creatinine, urea, lactate, glucose-6-phosphate, sucrose, ATP, ethanol, acetic acid, formic acid, carbon dioxide, amino acids, cholesterol, uric acid, methotrexate, phosphates, penicillin, nitrates, nitrites, sulfates or succinate.

Preferred Extracorporeal Device: The device further comprises a deheparinization device which is a continuous arteriovenous hemofiltration device or an extracorporeal membrane oxygenator located at an effluent of the device. The retaining means is a porous material on which the crosslinked protein or enzyme crystal is retained or a tube in which the crosslinked protein or enzyme crystal is present.

L108 ANSWER 5 OF 29 WPIX COPYRIGHT 2001 DERWENT INFORMATION LTD

AN **1999-244988** [21] WPIX

TI **Biosensor** for determining cholinesterase inhibiting material - has **platinum electrode, silver chloride reference electrode**, and working **platinum electrode** coated by modified graphite layer No Abstract.

DC B04 D16 **J04** S03

IN KREJCI, J; SAFAR, B; SKLADAL, P

PA (VOJE-N) VOJENSKY TECHNICKY USTAV OCHRANY

CYC 1

PI CZ 9700767 A3 19990217 (199921)* G01N027-327
CZ 284970 B6 19990414 (199921) G01N027-327
ADT CZ 9700767 A3 CZ 1997-767 19970313; CZ 284970 B6 CZ 1997-767 19970313
FDT CZ 284970 B6 Previous Publ. CZ 9700767
PRAI CZ 1997-767 19970313
IC ICM G01N027-327
ICS **C12Q001-46**
FS CPI EPI
FA NOAB
MC CPI: B04-L05A; B05-A03B; B11-C08B; B12-K04; D05-H09; J04-C04
EPI: S03-E03C1

L108 ANSWER 6 OF 29 WPIX COPYRIGHT 2001 DERWENT INFORMATION LTD
AN 1999-231752 [20] WPIX
DNN N1999-171707 DNC C1999-068307
TI New **biosensor** comprises electrically insulating base plate, electrode system, reaction layer containing enzyme and electron mediator.
DC A85 A96 A97 B04 D16 **J04** S03
IN IKEDA, S; NANKAI, S; YOSHIOKA, T
PA (MATU) MATSUSHITA ELECTRIC IND CO LTD; (MATU) MATSUSHITA DENKI SANGYO KK
CYC 28
PI EP 909952 A2 19990421 (199920)* EN 9p G01N033-487
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI
JP 11101770 A 19990413 (199925) 5p G01N027-327
JP 11101771 A 19990413 (199925) 5p G01N027-327
US 5906921 A 19990525 (199928) C12Q001-26 <--
CN 1220394 A 19990623 (199943) G01N027-30
ADT EP 909952 A2 EP 1998-118218 19980925; JP 11101770 A JP 1997-263483 19970929; JP 11101771 A JP 1997-263492 19970929; US 5906921 A US 1998-159686 19980924; CN 1220394 A CN 1998-119449 19980929
PRAI JP 1997-263492 19970929; JP 1997-263483 19970929
IC ICM **C12Q001-26**; G01N027-30; G01N027-327; G01N033-487
ICS **C12Q001-00**; **C12Q001-54**; G01N027-416; G01N033-50
AB EP 909952 A UPAB: 20011203
NOVELTY - The **biosensor** comprises an electrical insulating base plate, an electrode system having a working electrode and a counter electrode (comprising at least a reductant of a **redox** compound or a metal permitting electrolytic oxidation) formed on the base plate and a reaction layer formed on the vicinity of the electrode system and containing at least an **oxidoreductase** and an electron mediator.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included in a method for quantitatively measuring a substrate comprising, adding a sample to the reaction layer to cause a substrate contained in the sample to react with an enzyme contained in the reaction layer, applying a potential to the working electrode for reducing the electron mediator in oxidized state that remains not reduced in the course of the first step and finally measuring a reduction current flowing across the working electrode and the counter electrode.

USE - The **biosensor** is used as a glucose sensor especially comprising the use of **oxidoreductases** e.g. **glucose oxidase**, glucose dehydrogenase, alcohol oxidase, lactate oxidase, lactate dehydrogenase, fructose dehydrogenase, uricase, cholesterol oxidase, cholesterol **esterase**, xanthine oxidase and/or amino acid oxidase etc.

ADVANTAGE - The **biosensor** facilitates high accuracy quantization of a substrate concentration in a sample. The cost of production is reduced and a coating over the entire surface of the electrode system avoids the possible contact of the enzyme and electron mediator.

DESCRIPTION OF DRAWING(S) - The diagram illustrates an exploded perspective view of a glucose sensor with an omission of the reaction layer.
Base Plate 1
Electrodes 4,5
Reaction Layer 7

Lecithin Layer 8
Cover 9
Spacer 10
Air Vent 11
Opening 12.
Dwg.1/2
FS CPI EPI
FA AB; GI; DCN
MC CPI: A12-E13; A12-L04; A12-W11L; B04-C03; B04-D01; B04-L03; B05-A03A; B05-A03B; B05-C06; B11-C08B; B12-K04; D05-A02A; D05-H09; **J04-B01**
EPI: S03-E03C1; S03-E14H
TECH UPTX: 19990517
TECHNOLOGY FOCUS - ORGANIC CHEMISTRY - Preferred **Biosensor**: The **redox** compound is ferrocene or a ferrocene derivative. The counter electrode is composed of a mixture of at least one electrolytically oxidizable metal with carbon.

TECHNOLOGY FOCUS - INORGANIC CHEMISTRY - Preferred **Biosensor**: The counter electrode is composed of a mixture of at least one electrolytically oxidizable metal (especially **silver** or copper) with carbon.

TECHNOLOGY FOCUS - POLYMERS - Preferred **Biosensor**: The reaction layer further comprises a hydrophilic polymer.

L108 ANSWER 7 OF 29 WPIX COPYRIGHT 2001 DERWENT INFORMATION LTD
AN **1998-497007** [43] WPIX
DNC **C1998-149807**
TI **Bio-sensor** system for quantitative determination of formaldehyde - using immobilised formaldehyde-dismutase enzyme and means for indicating the resulting **pH** change.
DC A35 D16 E17 **J04**
IN BRYNIOK, D; KUEHN, M; RODEWYK, B
PA (FRAU) FRAUNHOFER GES FOERDERUNG ANGEWANDTEN
CYC 1
PI DE 19728663 C1 19981001 (199843)* 6p C12Q001-26 <--
ADT DE 19728663 C1 DE 1997-19728663 19970704
PRAI DE 1997-19728663 19970704
IC ICM **C12Q001-26**
AB DE 19728663 C UPAB: 19981028
Biosensor system for quantitative determination of formaldehyde comprising the enzyme formaldehyde transmutase either immobilised on the **pH** sensitive surface of a **pH** value- measuring electrochemical transducer, or immobilised on spherical particles in a reactor with a subsequently connected **pH** measuring electrochemical transducer.
USE - The sensor allows quantitative determination of formaldehyde which is widely used as an industrial raw material e.g. in the production of resins, plastics, dyes, adhesives and binders and also as a disinfectant and preservative. Due to the adverse effect of formaldehyde vapour on the health, it is important to have a reliable method of quantitative determination.
ADVANTAGE - The device has good sensitivity and selectivity to formaldehyde and allows quick, simple and accurate determination of formaldehyde without using added reagents.
Dwg.0/1
FS CPI
FA AB; DCN
MC CPI: A12-L04B; A12-W11L; D05-A01A2; D05-A01A4; D05-A01B3; D05-A01C1; D05-H09; E10-D01D; E11-Q03J; J04-C04

L108 ANSWER 8 OF 29 WPIX COPYRIGHT 2001 DERWENT INFORMATION LTD
AN 1998-018500 [02] WPIX
DNC C1998-006963
TI Crosslinked protein formulation having increased activity in aqueous and

mixed aqueous-organic solutions - useful for catalysing organic syntheses, in removing compounds by complex formation, as chromatography materials, in extracorporeal systems, in **bio-sensors**, etc..

DC A96 B04 D16 H03 **J04**
IN KHALAF, N K
PA (ALTU-N) ALTUS BIOLOGICS INC
CYC 78
PI WO 9744445 A1 19971127 (199802)* EN 75p C12N009-20
RW: AT BE CH DE DK EA ES FI FR GB GH GR IE IT KE LS LU MC MW NL OA PT SD SE SZ UG
W: AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GE GH HU IL IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK TJ TM TR TT UA UG UZ VN YU
ZA 9704325 A 19980225 (199813) 69p B01J000-00
AU 9730728 A 19971209 (199824) C12N009-20
EP 906417 A1 19990407 (199918) EN C12N009-20
R: AT BE CH DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE
US 5932212 A 19990803 (199937) A61K038-43
US 6042824 A 20000328 (200023) A61K038-43
JP 2000514282 W 20001031 (200059) 51p C12N009-20
KR 2000015993 A 20000325 (200104) C12N009-20
ADT WO 9744445 A1 WO 1997-US8526 19970520; ZA 9704325 A ZA 1997-4325 19970519; AU 9730728 A AU 1997-30728 19970520; EP 906417 A1 EP 1997-925652 19970520, WO 1997-US8526 19970520; US 5932212 A US 1996-652964 19960524; US 6042824 A Div ex US 1996-652964 19960524, US 1997-868088 19970603; JP 2000514282 W JP 1997-542648 19970520, WO 1997-US8526 19970520; KR 2000015993 A WO 1997-US8526 19970520, KR 1998-709554 19981121
FDT AU 9730728 A Based on WO 9744445; EP 906417 A1 Based on WO 9744445; US 6042824 A Div ex US 5932212; JP 2000514282 W Based on WO 9744445; KR 2000015993 A Based on WO 9744445
PRAI US 1996-652964 19960524; US 1997-868088 19970603
IC ICM A61K038-43; B01J000-00; C12N009-20
ICS A61K031-00; A61K038-00; A61K039-395; C07K001-02; C07K001-10; C07K016-00; C12N009-00; C12N011-00; C12N011-08; **C12Q001-00**; G01N033-543

AB WO 9744445 A UPAB: 19980112
Crosslinked protein formulations (A) have activity in organic and aqueous organic solvents (a) at least 1.7 times that of an equal amount of the corresponding protein (I) in crude or pure form; (b) specific activity per mg of solid at least 4.3 times that of crude or purified (I) or (c) activity at least 19 times that of the crosslinked protein in absence of surfactant.

The formulation has 1.7-90 times greater activity; 4-442 (especially at least 300) times greater specific activity, or 19-100 times greater activity than surfactant-free formulations. The surfactant is anionic, cationic or non-ionic and is present at 10-70 (preferably 25-45) wt.%, and the formulation may be lyophilised. The crosslinked protein is particularly in the form of microcrystals. PREFERRED MATERIALS - (I) is (a) an enzyme, particularly a **hydrolase** (selected from thermolysin, **esterase**, elastase, lipase, nitrilase, hydantoinase, protease, asparaginase, **urease** and lysozyme) but may also be a isomerase, **lyase**, **ligase**, **transferase** or **oxidoreductase** or (b) an antibody.
Typical of many suitable surfactants are linear alkylbenzene sulphonates, alkyl sulphates, carboxylic acids, quaternary ammonium compounds, nonylphenol or alcohol ethoxylates, polyethylene oxide or its derivatives etc. Organic solvents include diols, polyols, polyethers and water-soluble polymers, e.g. toluene.

USE - (A) can be used wherever reactions are catalysed by proteins in organic or mixed solvents, including industrial scale processes. Specifically they are used: (1) to make chiral organic molecules, peptides, carbohydrates or lipids from appropriate substrates (e.g. speciality chemicals or pharmaceuticals); (2) to separate particular substances from solution by complex formation (particularly (A) is immobilised); (3) as chromatographic materials; (4) in **biosensors** for detecting analytes; (5) in extracorporeal systems, and (6) in reactive

topical compositions (for protection, repair or detoxification of particular areas), including use as antioxidants in cosmetics or incorporated into e.g. dressings. Additionally (not claimed) they can be used to catalyse gas-phase reactions, e.g. as catalytic converters, to clean oil spills and to purify air.

ADVANTAGE - (A) are more active in organic solvents than conventionally immobilised (I) and retain their activity in harsh solvent conditions. Since they are crystalline, activity is uniform across the entire crystal volume and the formulations are highly resistant to proteolysis and extremes of **pH** and temperature, so provide improved yields.When used in **biosensors** or extracorporeal systems, they provide increased sensitivity, volume productivity and throughput.

Dwg.0/0

FS CPI
FA AB; DCN
MC CPI: A03-C01; A12-L04; A12-W11; B04-C03C; B04-L01; B04-N04; B10-A09A; B10-A09B; B10-A21; B10-A22; B10-C02; B11-B; D05-A02; D05-H09; D05-H13; H03-G; H06-C03; J04-E02

L108 ANSWER 9 OF 29 WPIX COPYRIGHT 2001 DERWENT INFORMATION LTD
AN 1997-404871 [38] WPIX
DNN N1997-336546 DNC C1997-130679
TI **Amperometric sensor**, especially for blood sugar determination - having working and **reference electrodes** separated by porous, non-conductive sheet to increase sensitivity.
DC B04 D16 **J04** S03
IN HILDENBRAND, K; SIEGMUND, U; SIEGMUND, H
PA (FARB) BAYER AG
CYC 14
PI EP 790498 A1 19970820 (199738)* DE 11p G01N027-327
R: AT BE CH DE DK ES FI FR GB IT LI
DE 19605583 A1 19970821 (199739) 8p G01N027-49
JP 09229894 A 19970905 (199746) 7p G01N027-28
CA 2197385 A 19970816 (199751) G01R015-00
US 5916156 A 19990629 (199932) G01N027-327
ADT EP 790498 A1 EP 1997-101600 19970203; DE 19605583 A1 DE 1996-19605583 19960215; JP 09229894 A JP 1997-41400 19970212; CA 2197385 A CA 1997-2197385 19970212; US 5916156 A US 1997-798387 19970207
PRAI DE 1996-19605583 19960215
REP DE 2021285; EP 276782; EP 471986; EP 546536; WO 9427140
IC ICM G01N027-28; G01N027-327; G01N027-49; G01R015-00
ICS **C12Q001-00**; G01N027-26; G01N027-416; G01N033-483; G01N033-66
AB EP 790498 A UPAB: 19970922
Amperometric test device has the working **electrode** and the **reference electrode** separated by a permeable, non-electrically conductive sheet material containing reagents.

USE - The device is an electrochemical sensor, especially a **biosensor** useful in diagnostic analysis of body fluids. The device is especially a diagnostic **biosensor** for the determination of blood sugar utilising **glucose oxidase** as receptor component. The use of the device in immunoassays is also possible.

ADVANTAGE - Provision of the sheet material is a simple method of increasing the reagent-matrix interface and thus increasing the sensitivity, without markedly increasing the volume of sample (e.g. blood drops) required. The sensors have good reproducibility and are easy to produce.

Dwg.1/1

FS CPI EPI
FA AB; GI; DCN
MC CPI: B04-B04D5; B04-L03A; B10-A07; B11-C07A7; B11-C08B; B12-K04A; D05-H09; **J04-B01**
EPI: S03-E03C

L108 ANSWER 10 OF 29 WPIX COPYRIGHT 2001 DERWENT INFORMATION LTD

AN 1997-247412 [23] WPIX
DNC C1997-080326
TI Enzyme electrode with increased working and shelf lives used as **bio-sensor** - comprises porous electroconductive support onto which enzyme is adsorbed and protective layer preventing leaching of enzyme.
DC A96 B04 D16 **J04**
IN ASAKURA, T; KHAN, G F; OHWA, M; YAMATO, H
PA (JAPA-N) JAPAT LTD; (CIBA) CIBA GEIGY JAPAN LTD
CYC 14
PI EP 771867 A2 19970507 (199723)* EN 11p C12M001-40
R: BE CH DE ES FR GB IT LI NL SE
JP 09127041 A 19970516 (199730) 9p G01N027-327
CA 2173551 A 19970501 (199735) C12Q001-25 <--
KR 97021319 A 19970528 (199822) C12Q001-26 <--
TW 354336 A 19990311 (199934) C12M001-40
ADT EP 771867 A2 EP 1996-810200 19960401; JP 09127041 A JP 1996-95310 19960417; CA 2173551 A CA 1996-2173551 19960404; KR 97021319 A KR 1996-11709 19960418; TW 354336 A TW 1996-104271 19960411
PRAI EP 1995-810752 19951130; EP 1995-810670 19951030
REP No-SR.Pub
IC ICM C12M001-40; **C12Q001-25**; **C12Q001-26**; G01N027-327
ICS **C12Q001-00**; G01N027-49; H01B001-22; H01B005-14
AB EP 771867 A UPAB: 19970626
Enzyme electrode comprises: (a) an electroconductive support member (ESM) comprising a porous electroconductive layer; (b) an enzyme adsorbed or immobilised onto the surface of the porous layer, and (c) a protecting layer to prevent leaching of the enzyme from the porous layer. Also claimed are: (1) a process for indicating, **amperometrically**, the catalytic activity of an enzyme contained in the active coating of an enzyme in the presence of a liquid containing a substance acted on by the enzyme and of an electrical potential on the electrode, and (2) an electroconductive polymer film which contains at least 1 surface a layer of finely divided particles of a **platinum** group metal.

The porous electroconductive layer is formed of carbon particles in intimate surface contact with finely divided particles of a **platinum** group metal and bonded together by a resin, the layer comprising resin-bonded, metallised carbon particles distributed substantially uniformly throughout. The resin is e.g. fluorocarbon resin, a polyester resin or a cellulose. The porous electroconductive layer comprises an electroconductive polymer film and a layer comprising particles of the **platinum** group metal, the film being made of a polypyrrole. The enzyme is immobilised or adsorbed at 10-3000 (preferably 30-1500) mu g/cm2 and is an **oxidoreductase** e.g. **glucose oxidase**, lactate oxidase, cholesterol oxidase, choline oxidase, glutamate oxidase, pyruvate oxidase, etc. The protecting layer comprises at least 1 of gelatin, polyvinyl alcohol, poly(ethylene oxide), polyvinyl pyrrolidone, polyacrylamide, etc.

USE - The electrode can be used as an **amperometric biosensors**, **biosensors**, chemical sensors or in bioreactors.

ADVANTAGE - The electrodes have extended working and shelf lives, high sensitivity, extended linearity and a low interference current as a **biosensor**. The electrodes are also easily prepared at low cost and have increased storage stability.

Dwg.0/3
FS CPI
FA AB; DCN
MC CPI: A12-E14; A12-V03C2; A12-W11L; B04-C02; B04-C03; B04-L01; B05-C06; B11-C08B; B12-K04; D05-A01A2; D05-A01A5; D05-A01B1; D05-H09; **J04-B01**

L108 ANSWER 11 OF 29 WPIX COPYRIGHT 2001 DERWENT INFORMATION LTD
AN 1997-108972 [10] WPIX
DNN N1997-090113 DNC C1997-034840
TI Electrochemical **bio-sensor** with improved compactness

and plasticity - comprises electro-conducting material, chemical mediator, solid binding marker, bio-catalyst, and opt. substance capable of sorption of mediator.

DC B04 C07 D14 D16 J04 S03

IN **MIERTUS, S; STREDANSKY, M;** SVORC, J

PA (SAIC-N) SAICOM SRL; (RICE-N) SOC COOP CENT RICERCHE POLY-TECH A RESPO

CYC 72

PI WO 9702359 A1 19970123 (199710)* EN 48p C12Q001-00
RW: AT BE CH DE DK EA ES FI FR GB GR IE IT KE LS LU MC MW NL OA PT SD SE SZ UG
W: AL AM AU AZ BB BG BR BY CA CN CZ EE GE HU IL IS JP KE KG KP KR KZ LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL RO RU SD SG SI SK TJ TM TR TT UA UG US UZ VN
AU 9665181 A 19970205 (199721) C12Q001-00
IT 1275482 B 19970806 (199824) C25B000-00
EP 847447 A1 19980617 (199828) EN C12Q001-00
R: AT BE CH DE DK ES FI FR GB GR IE IT LI LU NL PT SE SI
SK 9701795 A3 19980708 (199836) C12Q001-00
EP 847447 B1 19991110 (199952) EN C12Q001-00
R: AT BE CH DE DK ES FI FR GB GR IE IT LI LU NL PT SE SI
DE 69605120 E 19991216 (200005) C12Q001-00
ES 2141518 T3 20000316 (200021) C12Q001-00

ADT WO 9702359 A1 WO 1996-EP2919 19960703; AU 9665181 A AU 1996-65181 19960703; IT 1275482 B IT 1995-MI1441 19950705; EP 847447 A1 EP 1996-924868 19960703, WO 1996-EP2919 19960703; SK 9701795 A3 WO 1996-EP2919 19960703, SK 1997-1795 19960703; EP 847447 B1 EP 1996-924868 19960703, WO 1996-EP2919 19960703; DE 69605120 E DE 1996-605120 19960703, EP 1996-924868 19960703, WO 1996-EP2919 19960703; ES 2141518 T3 EP 1996-924868 19960703

FDT AU 9665181 A Based on WO 9702359; EP 847447 A1 Based on WO 9702359; EP 847447 B1 Based on WO 9702359; DE 69605120 E Based on EP 847447, Based on WO 9702359; ES 2141518 T3 Based on EP 847447

PRAI IT 1995-MI1441 19950705

REP 3.Jnl.Ref; EP 400918; EP 415124; EP 563795; US 5269891; WO 9102485; WO 9424548

IC ICM C12Q001-00; C25B000-00
ICS G01N027-327

AB WO 9702359 A UPAB: 19970417

Electrochemical **biosensor** comprises:

(a) an electro-conducting material in the form of powder or grains;

(b) a chemical mediator;

(c) opt. a substance capable of sorption of the chemical mediator;

(d) a solid binding marker (selected from opt. unsatd. hydrocarbons contg. 12-60C atoms and opt. substd. by at least 1 gp. (selected from OH, SH, NH2, CO, CHO, SO3H, COOH, OR1, SR1, NR1R2 or COOR1, where R1 and R2 are 1-30C hydrocarbon gps. which opt. contg. one or more heteroatoms), esters of fatty acids with glycerol, and esters of fatty acids with cholesterol), and

(e) a biocatalyst, selected from enzymes, cells, cellular components, tissues, immuno-proteins and DNA.

USE - The **biosensors** are capable of quantitatively determining a specific analyte contained in a sample. They may be used in human and veterinary diagnostics, in industrial processes, in the quality control of food, in biotechnology, in the pharmaceutical industry and in environmental monitoring.

ADVANTAGE - The **biosensors** show good mechanical properties, particularly compactness and plasticity, and do not disintegrate during use. They provide a rapid and easy determn. of specific analytes.

Dwg.0/19

FS CPI EPI

FA AB; DCN

MC CPI: B01-D02; C01-D02; B04-E01; C04-E01; B04-F01; C04-F01; B04-L01; C04-L01; B10-A09B; C10-A09B; B10-B01B; C10-B01B; B10-B02; C10-B02; B10-B03B; C10-B03B; B10-B04B; C10-B04B; B10-C02; C10-C02; B10-C03; C10-C03; B10-C04E; C10-C04E; B10-E03; C10-E03; B10-E04; C10-E04; B10-F02; C10-F02; B10-G02; C10-G02; B10-H01; C10-H01; B10-J02;

C10-J02; B12-K04; C12-K04; D03-K03; D03-K04; D05-H09; J04-B01
EPI: S03-E03C1; S03-E14H

L108 ANSWER 12 OF 29 WPIX COPYRIGHT 2001 DERWENT INFORMATION LTD
AN **1996-467711** [47] WPIX
DNN **N1996-393980** DNC **C1996-146708**
TI Reliable **bio-sensor** - has **reference electrode** facing activity indicator **electrodes**.
DC B04 **J04** S03
IN LEE, H; YEE, H
PA (GLDS) GOLDSTAR ELECTRON CO LTD; (GLDS) LG ELECTRONICS CO LTD; (GLDS) LG SEMICON CO LTD
CYC 3
PI JP 08233774 A 19960913 (199647)* 7p G01N027-327
US 5672256 A 19970930 (199745) 11p G01N027-26
KR 151203 B1 19981201 (200031) G01N027-00
ADT JP 08233774 A JP 1995-345109 19951208; US 5672256 A US 1995-569740 19951208; KR 151203 B1 KR 1994-33335 19941208
PRAI KR 1994-33335 19941208
IC ICM G01N027-00; G01N027-26; G01N027-327
ICS **C12Q001-32**; G01N027-27
AB JP 08233774 A UPAB: 19961124
A **reference electrode** is placed facing to activity indicator **electrodes** and inactivity indicator **electrodes**
.
ADVANTAGE - A highly reliable sensor can be provided.
Dwg.1/7
FS CPI EPI
FA AB; GI
MC CPI: B11-C08B; B12-K04A; J04-C04
EPI: S03-E03
ABEQ US 5672256 A UPAB: 19971113
A multi-**electrode biosensor** comprises:
a) a substrate;
b) a plurality of working **electrodes** formed on the substrate, the plurality of working **electrodes** including at least two active working **electrodes** and an inert working **electrode**, wherein the active working **electrode** includes a bioactive material and the inert working **electrode** is bioinactive;
c) a counter **electrode** formed on the substrate; and
d) a **reference electrode** formed on the substrate.
Dwg.0/7

L108 ANSWER 13 OF 29 WPIX COPYRIGHT 2001 DERWENT INFORMATION LTD
AN 1996-426764 [43] WPIX
DNN N1996-359331 DNC C1996-134466
TI Quantitative electrochemical determn. of oxido-reductase substrate - using **bio-sensor** with **reference electrode**, esp. useful for glucose determn., has improved accuracy and reliability.
DC B04 D16 **J04** S03
IN IKEDA, S; NANKAI, S; YOSHIOKA, T; BABA, H; MIYAZAKI, S; TOKUNO, Y; TSUTSUMI, H
PA (MATU) MATSUSHITA ELECTRIC IND CO LTD; (MATU) MATSUSHITA ELEC IND CO LTD; (MATU) MATSUSHITA DENKI SANGYO KK
CYC 6
PI EP 732406 A1 19960918 (199643)* EN 19p C12Q001-00 <--
R: DE FR GB
CA 2153350 A 19960918 (199703) C12Q001-26 <--
US 5582697 A 19961210 (199704) 14p G01N027-26
JP 08320304 A 19961203 (199707) 10p G01N027-327
US 5650062 A 19970722 (199735) 14p G01N027-26
JP 3102627 B2 20001023 (200056) 10p G01N027-327
CA 2153350 C 20010904 (200155) EN C12Q001-26 <--
ADT EP 732406 A1 EP 1995-110746 19950710; CA 2153350 A CA 1995-2153350 19950706; US 5582697 A US 1995-425820 19950420; JP 08320304 A JP

1995-237147 19950914; US 5650062 A CIP of US 1995-425820 19950420, US 1995-526557 19950912; JP 3102627 B2 JP 1995-237147 19950914; CA 2153350 C CA 1995-2153350 19950706

FDT US 5650062 A CIP of US 5582697; JP 3102627 B2 Previous Publ. JP 08320304

PRAI JP 1995-58939 19950317

REP DE 4115795; EP 359831; EP 502504; EP 537761

IC ICM **C12Q001-00; C12Q001-26;** G01N027-26; G01N027-327
ICS C12M001-40; G01N027-416; G01N027-42

AB EP 732406 A UPAB: 19961025
Quantitative determn. of an analyte in a liq. sample comprises using a **biosensor** capable of electrochemically measuring the amt. of an electron acceptor that has been reduced by electrons generated in a reaction between the analyte and an **oxidoreductase**. The **biosensor** comprises:(a) an electrically insulating substrate;(b) an **electrode** system formed on the substrate and including a working **electrode**, a counter **electrode** and a third **electrode** for detecting a liq. junction, and(c) an **oxidoreductase**-contg. reaction layer formed over the working and counter **electrodes**.
The method comprises applying a voltage between the counter **electrode** and third **electrode**, supplying the sample to the reaction layer, detecting an electrical change between the counter **electrode** and third **electrode** generated by the supply of the sample to the reaction layer, applying a voltage to the working **electrode** after the detection using the third **electrode** as a **reference**, and measuring the current generated between the working and counter **electrodes**.
Also claimed is a device which comprises a **biosensor** as above removably connected to a measuring device.
USE - The method is esp. useful for glucose determn.
ADVANTAGE - Using the third **electrode** as a **reference electrode** as well as a sample detector improves the accuracy and reliability of the measurements.
Dwg.6/9

FS CPI EPI

FA AB; GI; DCN

MC CPI: B04-L03; B10-A07; B11-C08B; B12-K04A; D05-A01A4; D05-A01B1; **J04-B01**
EPI: S03-E03

ABEQ US 5582697 A UPAB: 19970122
A **biosensor** for quantifying a substrate in a sample liquid by electrochemically measuring an amount of an electron acceptor that has been reduced by electrons generated in a reaction between the substrate and an **oxidoreductase**, comprising:
an electrically insulating substrate;
an **electrode** system formed on the substrate including a working **electrode**, a counter **electrode** and a third **electrode** used for detecting a liquid junction; and
a reaction layer that is formed over at least the working **electrode** and the counter **electrode** of the **electrode** system and includes the **oxidoreductase**,
wherein the third **electrode** is disposed farther from a sample supply port than the working **electrode** and the counter **electrode**, so that a sample liquid supplied through the sample supply port reaches the third **electrode** after reaching the working **electrode** and the counter **electrode**.
Dwg.0/8

ABEQ US 5650062 A UPAB: 19970828
A method for quantifying a substrate in a sample liquid by using a **biosensor** comprising:
an electrically insulating substrate;
an **electrode** system formed on the substrate including a working **electrode**, a counter **electrode** and a third **electrode** used for detecting a liquid junction; and
a reaction layer that is formed over at least the working **electrode** and the counter **electrode** of the

electrode system and includes an oxido-reductase;
wherein the method of quantifying the substrate comprises the steps of:
applying a voltage between the counter **electrode** and the third **electrode**;
supplying a sample liquid to the reaction layer;
detecting an electrical change between the counter **electrode** and the third **electrode** caused by supplying the sample liquid to the reaction layer;
applying a voltage between the working **electrode** and both of the third **electrode** and the counter **electrode** after detecting the electrical change; and
measuring a current flowing between the counter **electrode** and the working **electrode** after applying the voltage.
Dwg.0/8

L108 ANSWER 14 OF 29 WPIX COPYRIGHT 2001 DERWENT INFORMATION LTD
AN 1996-161350 [17] WPIX
DNN N1996-135176 DNC C1996-051075
TI Potentiometric or **amperometric bio-sensors** for chemical parameters - with transducer and biological component immobilised in or on polymer matrix covered with heat-sealed membrane.
DC B04 D16 **J04** S03
IN DOLEZAL, A; KONTSCHIEDER, H; RITTER, C; SCHAFFAR, B; SCHAFFAR, B M
PA (AVLV) AVL GES VERBRENNUNGSKRAFT & MESSTECHNIK; (AVLV) AVL MEDICAL INSTR AG
CYC 5
PI

EP 702228	A2	19960320 (199617)*	DE	12p	G01N027-327
R: DE FR GB					
AT 9401760	A	19960915 (199642)			G01N021-75
AT 402452	B	19970315 (199717)			G01N021-75
US 5683562	A	19971104 (199750)		10p	G01N027-26
EP 702228	A3	19971022 (199814)			G01N027-327
EP 702228	B1	19991124 (199954)	DE		G01N027-327
R: DE FR GB					
DE 59507280	G	19991230 (200007)			G01N027-327

ADT EP 702228 A2 EP 1995-890161 19950911; AT 9401760 A AT 1994-1760 19940914; AT 402452 B AT 1994-1760 19940914; US 5683562 A US 1995-528250 19950914; EP 702228 A3 EP 1995-890161 19950911; EP 702228 B1 EP 1995-890161 19950911; DE 59507280 G DE 1995-507280 19950911, EP 1995-890161 19950911
FDT AT 402452 B Previous Publ. AT 9401760; DE 59507280 G Based on EP 702228
PRAI AT 1994-1760 19940914
REP 1.Jnl.Ref; EP 206218; EP 354204; EP 476980; EP 609760; JP 63172951; US 4894137; US 5326449
IC ICM G01N021-75; G01N027-26; G01N027-327
ICS **C12Q001-00**; G01N021-77
AB EP 702228 A UPAB: 19960428
Sensor for measuring a chemical parameter of a sample comprises 1 potentiometric or **amperometric** transducer and opt. an optical transducer, and 1 biological component, all deposited on a flat substrate in the form of ''sensor spots'' covered by a membrane which is heat-sealed around each spot. Each potentiometric or **amperometric** sensor spot is in contact with a conductive strip on the substrate surface, and the heat-seal is interrupted in the vicinity of this strip. Also claimed are: (1) a process for producing such sensors by depositing a conductive strip on the substrate; depositing an **amperometric** or potentiometric transducer layer at one end of the strip; depositing 1 biological component on the transducer; covering at least the transducer and surrounding area with a membrane and heat-sealing the membrane to the substrate around the transducer, except in the vicinity of the strip, and (2) a process as above where the transducer and biological component(s) are immobilised in or on a polymer matrix deposited at the end of the strip.
USE - The device can be used in medical and biomedical laboratories and for food analyses. The biological component can be an enzyme, an antibody, an antigen or RNA/DNA.

ADVANTAGE - The processes lend themselves to fully or semi-automatic mass prodn., since no drilling or glueing is involved, the spots can be deposited by screen printing or dispensing techniques, and the membrane can be sealed with a hot punch or laser without damaging the conductive strip or the biological component(s).
Dwg.17/20

FS CPI EPI
FA AB; GI; DCN
MC CPI: B04-C03; B04-L03A; B05-A03B; B12-K04; D05-A01A2; D05-A01B1; D05-H09; D05-H10; **J04-B01**
EPI: S03-E03C; S03-E04D; S03-E14H
ABEQ US 5683562 A UPAB: 19971217
Planar sensor for determining a chemical parameter of a sample, comprising a substrate whose surface is at least partly plane and is provided with at least one potentiometric, **amperometric** or optical transducer, and at least one biochemical component transducer and biochemical component, being provided on the surface of the substrate or at least part of the surface as a sensor spot protected by a cover membrane which is gas and ion permeable and is heat welded to the surface of the substrate facing the sample forming a thermal seal, wherein those of the sensor spots that comprise a potentiometric or **amperometric** transducer are in contact with a strip conductor attached to the plane surface of the substrate, and wherein the thermal seal of the cover membrane is interrupted where the conducting stripes lead away from the sensor spots.
Dwg.0/21

L108 ANSWER 15 OF 29 WPIX COPYRIGHT 2001 DERWENT INFORMATION LTD
AN **1995-302490** [39] WPIX
DNN **N1995-229663** DNC **C1995-135390**
TI **Amperometric** sensors, e.g., for determining blood glucose - comprising an electrode, which is modified by electrochemical deposition of, e.g., Prussian blue.
DC B04 D16 **J04** S03
IN JAFFARI, S A; TURNER, A P F
PA (UYCR-N) UNIV CRANFIELD
CYC 21
PI WO 9521934 A1 19950817 (199539)* EN 31p C12Q001-00 <--
RW: AT BE CH DE DK ES FR GB GR IE IT LU MC NL PT SE
W: CA FI GB JP RU US
GB 2301441 A 19961204 (199701) 1p C12Q001-00 <--
GB 2301441 B 19980304 (199812) C12Q001-00 <--
ADT WO 9521934 A1 WO 1995-GB265 19950210; GB 2301441 A WO 1995-GB265 19950210, GB 1996-16824 19960809; GB 2301441 B WO 1995-GB265 19950210, GB 1996-16824 19960809
FDT GB 2301441 A Based on WO 9521934; GB 2301441 B Based on WO 9521934
PRAI GB 1994-2591 19940210
REP 4.Jnl.Ref
IC **C12Q001-54**; G01N027-327
AB WO 9521934 A UPAB: 19951004
The following are claimed: (A) an enzyme electrode which comprises: (a) a modified electrode with a conductive element with a surface, and a coating of a hexacyanoferrate-derived material or Prussian blue provided on the surface, and (b) an enzyme, which is retained on or adjacent to the coating, and which is selected so that a substrate (or its prods.) is capable of being electrochemically oxidised or reduced at the modified electrode. (B) an **amperometric biosensor** which comprises: (a) a cell for receiving an analyte, and (b) a sensing electrode (which is a modified electrode as described in (A) above), a standard electrode and, opt., a counter electrode.
The **biosensor** includes an enzyme which is selected so that a substrate (or its prods.) is capable of being electrochemically oxidised or reduced at the modified electrode.
The enzyme is disposed in relation to the modified electrode so that, in the operation of the **biosensor**, the enzyme affects the amt. of substrate or prod. , and thus affects a signal current of the cell. (C) a method for the determn. of the amt. of an analyte in a sample which

comprises: (a) contacting a soln. contg. the analyte with an enzyme electrode (as described in (A)) and with a standard electrode; (b) applying a potential between the electrodes, and (c) monitoring the electrical current. (D) a method for the determn. of an analyte in an analyte soln. in the presence of one or more potentially interfering substances selected from ascorbate, uric acid and 4-acetamidophenol, which comprises: (a) contacting the analyte soln. with a modified electrode (as described above) and with a standard electrode; (b) applying a potential between the electrodes, and (c) monitoring the electrical current. (E) a method for the determn. of an analyte by means of an affinity reaction comprises the use of an enzyme label, the amt. of which is detected **amperometrically** by determining a substrate (or its prods.) using a modified electrode (which is as described above).

USE - The enzyme electrode/**biosensor** systems are useful for **amperometric** determination of analytes such as glucose (in, e.g., whole blood, serum or plasma).

ADVANTAGE - The modified electrodes are stable, and are capable of operating at low potential. They are selective and do not exhibit leaching.

Dwg.0/10

FS CPI EPI

FA AB; DCN

MC CPI: B04-B04D4; B04-B04D5; B04-L03A; B05-A03A; B10-A07; B11-C08E3; B12-K04A; D05-A01A5; D05-A01B1; D05-H09; J04-C04

EPI: S03-E03C; S03-E14H

ABEQ GB 2301441 B UPAB: 19980323

The following are claimed: (A) an enzyme electrode which comprises: (a) a modified electrode with a conductive element with a surface, and a coating of a hexacyanoferrate-derived material or Prussian blue provided on the surface, and (b) an enzyme, which is retained on or adjacent to the coating, and which is selected so that a substrate (or its prods.) is capable of being electrochemically oxidised or reduced at the modified electrode. (B) an **amperometric biosensor** which comprises: (a) a cell for receiving an analyte, and (b) a sensing electrode (which is a modified electrode as described in (A) above), a standard electrode and, opt., a counter electrode.

The **biosensor** includes an enzyme which is selected so that a substrate (or its prods.) is capable of being electrochemically oxidised or reduced at the modified electrode.

The enzyme is disposed in relation to the modified electrode so that, in the operation of the **biosensor**, the enzyme affects the amt. of substrate or prod. , and thus affects a signal current of the cell. (C) a method for the determn. of the amt. of an analyte in a sample which comprises: (a) contacting a soln. contg. the analyte with an enzyme electrode (as described in (A)) and with a standard electrode; (b) applying a potential between the electrodes, and (c) monitoring the electrical current. (D) a method for the determn. of an analyte in an analyte soln. in the presence of one or more potentially interfering substances selected from ascorbate, uric acid and 4-acetamidophenol, which comprises: (a) contacting the analyte soln. with a modified electrode (as described above) and with a standard electrode; (b) applying a potential between the electrodes, and (c) monitoring the electrical current. (E) a method for the determn. of an analyte by means of an affinity reaction comprises the use of an enzyme label, the amt. of which is detected **amperometrically** by determining a substrate (or its prods.) using a modified electrode (which is as described above).

USE - The enzyme electrode/**biosensor** systems are useful for **amperometric** determination of analytes such as glucose (in, e.g., whole blood, serum or plasma).

ADVANTAGE - The modified electrodes are stable, and are capable of operating at low potential. They are selective and do not exhibit leaching.

Dwg.0/0

L108 ANSWER 16 OF 29 WPIX COPYRIGHT 2001 DERWENT INFORMATION LTD

AN **1995-245660** [32] WPIX

DNN **N1995-190800** DNC **C1995-112741**
TI **Amperometric** electrode making method for blood glucose **bio-sensor** - by applying electrode carbon ink to polymer substrate to form working electrode, placing in gas plasma cleaner and exciting gas plasma with high rf signal.
DC B04 **J04** S03
IN JOHNSON, L D; MURRAY, A J; MUSHO, M K
PA (FARB) BAYER CORP; (MILE) MILES INC; (MILE) MILES LAB INC
CYC 20
PI US 5429735 A 19950704 (199532)* 6p G01N027-26
EP 691539 A2 19960110 (199607) EN 6p G01N027-30
R: AT BE CH DE DK ES FR GB GR IE IT LI LU NL PT SE
AU 9523257 A 19960111 (199609) G01N027-327
JP 08015210 A 19960119 (199613) 5p G01N027-30
CA 2151413 A 19951228 (199616) C12M001-40
EP 691539 A3 19960724 (199639) G01N027-26
AU 692861 B 19980618 (199835) G01N027-327
ADT US 5429735 A US 1994-265913 19940627; EP 691539 A2 EP 1995-109199 19950614; AU 9523257 A AU 1995-23257 19950626; JP 08015210 A JP 1995-114499 19950512; CA 2151413 A CA 1995-2151413 19950609; EP 691539 A3 EP 1995-109199 19950614; AU 692861 B AU 1995-23257 19950626
FDT AU 692861 B Previous Publ. AU 9523257
PRAI US 1994-265913 19940627
REP 6.Jnl.Ref; EP 289345; EP 537761; JP 62232554; JP 63144246; JP 63317096
IC ICM C12M001-40; G01N027-26; G01N027-30; G01N027-327
ICS **C12Q001-54**; G01N027-49
AB US 5429735 A UPAB: 19950818
The method of making an **amperometric** electrode comprises providing a substrate, applying an electrode carbon ink to the substrate to form a working electrode, the electrode carbon ink containing set amounts of graphite and carbon black and cleaning the working electrode utilizing a gas plasma. The gas plasma is a nitrogen gas plasma or an oxygen gas plasma and a reagent layer to the working electrode after the cleaning step is deposited.

The step of providing a substrate includes the step of providing a polymer substrate. A high radio frequency signal excites the gas plasma for a short exposure time in a range between 10 seconds and 30 seconds. Then a reagent layer is deposited to the plasma treated working electrode.

USE/ADVANTAGE - Gives reliable and reproducible electrodes without time consuming processes such as polishing and heat treatment.

Dwg.3/5
FS CPI EPI
FA AB; GI; DCN
MC CPI: B04-B04D5; B05-C03; B05-C06; B10-A07; B11-C08B; B12-K04A; **J04-B01**
EPI: S03-E03C; S03-E14H1

L108 ANSWER 17 OF 29 WPIX COPYRIGHT 2001 DERWENT INFORMATION LTD
AN 1995-082507 [12] WPIX
DNC C1995-037164
TI Enzyme-labelled probes and assay reagents - labelled with Candida rugosa lipase, isoenzyme or analogue; useful as bio-assay reagents, gene probes and **bio-sensor** components.
DC B04 D16 **J04** S03
IN ECKER, B; KYNCLOVA, E; PITTNER, F; SCHALKHAMMER, T; WAKOLBINGER, W
PA (ECKE-I) ECKER B; (KYNC-I) KYNCLOVA E; (PITT-I) PITTNER F; (SCHA-I) SCHALKHAMMER T; (WAKO-I) WAKOLBINGER W; (BOEF) BOEHRINGER MANNHEIM GMBH; (HOFF) ROCHE DIAGNOSTICS GMBH
CYC 22
PI AT 9302071 A 19950115 (199512)* 14p C12Q001-44 <--
WO 9510775 A1 19950420 (199521) DE 31p G01N033-535
RW: AT BE CH DE DK ES FR GB GR IE IT LU MC NL PT SE
W: AU CA JP NZ US
AT 400036 B 19950715 (199533) C12Q001-44 <--
AU 9478557 A 19950504 (199536) G01N033-535
EP 679257 A1 19951102 (199548) DE G01N033-535

R: AT CH DE ES FR GB IT LI
JP 07509618 W 19951026 (199551) 10p C12Q001-44 <--
AU 671392 B 19960822 (199642) G01N033-535
ADT AT 9302071 A AT 1993-2071 19931015; WO 9510775 A1 WO 1994-EP3379 19941013; AT 400036 B AT 1993-2071 19931015; AU 9478557 A AU 1994-78557 19941013; EP 679257 A1 EP 1994-929543 19941013, WO 1994-EP3379 19941013; JP 07509618 W WO 1994-EP3379 19941013, JP 1995-511295 19941013; AU 671392 B AU 1994-78557 19941013
FDT AT 400036 B Previous Publ. AT 9302071; AU 9478557 A Based on WO 9510775; EP 679257 A1 Based on WO 9510775; JP 07509618 W Based on WO 9510775; AU 671392 B Previous Publ. AU 9478557, Based on WO 9510775
PRAI AT 1993-2071 19931015
REP 2.Jnl.Ref; EP 384717; WO 8603774; WO 9221778
IC ICM **C12Q001-44**; G01N033-535
ICS **C12Q001-34**; **C12Q001-68**; G01N033-58
ICI C12Q001-44, C12R001:72; C12Q001-44, C12R001:72
AB AT 9302071 A UPAB: 19990416
Enzyme-labelled probes or assay reagents are labelled with Candida rugosa lipase (CRL), a CRL isoenzyme or a lipase-active CRL analogue with at least 70% amino acid homology. The probe is opt. conjugated to a bio-recognition gp.
USE - The prods. are useful as bioassay reagents, as components of teat strips and **biosensors** or as gene probes (claimed).
ADVANTAGE - CRL has better thermal stability than alkaline **phosphatase** (active up to at least 60 deg. C), is not affected by EDTA or urea, has good compatibility with organic solvents (e.g. toluene), is stable over a **pH** range of 2.5-9, forms conjugates with good storage stability, and can be detected at levels as low as 5 pg.
Dwg.0/0
FS CPI EPI
FA AB
MC CPI: B04-L05A; B11-C08E; B12-K04A; D05-A01A2; D05-A01A4; D05-A01A5; D05-A01B3; D05-H07; D05-H09; D05-H11; D05-H12; J04-B01B; J04-C04
EPI: S03-E14H4

L108 ANSWER 18 OF 29 WPIX COPYRIGHT 2001 DERWENT INFORMATION LTD
AN **1995-062458** [09] WPIX
DNN **N1995-049722** DNC **C1995-027684**
TI New **bio-sensor** for analytes - comprising an electrode system, a hydrophilic polymer and a sepd enzyme and buffer system.
DC B03 B04 D13 D16 E13 **J04** S03 S05
IN FUJISAWA, S; MIYAHARA, M; NANKAI, S; YAMAMOTO, T; YOSHIOKA, T; MIYASHITA, M; TSUJI, S
PA (MATU) MATSUSHITA ELEC IND CO LTD; (MATU) MATSUSHITA ELECTRIC IND CO LTD
CYC 5
PI EP 636879 A2 19950201 (199509)* EN 14p G01N027-327
R: DE FR GB
EP 636879 A3 19950426 (199545) G01N027-327
US 5658443 A 19970819 (199739) 11p G01N027-26
JP 3070818 B2 20000731 (200041) 7p G01N027-327
JP 07083872 A 19950331 (200042) G01N027-327
US 36991 E 20001219 (200102) G01N027-26
ADT EP 636879 A2 EP 1994-111420 19940721; EP 636879 A3 EP 1994-111420 19940721; US 5658443 A US 1994-277556 19940719; JP 3070818 B2 JP 1994-169168 19940721; JP 07083872 A JP 1994-169168 19940721; US 36991 E US 1994-277556 19940719, US 1999-375705 19990813
FDT JP 3070818 B2 Previous Publ. JP 07083872; US 36991 E Reissue of US 5658443
PRAI JP 1993-182583 19930723
REP No-SR.Pub; 1.Jnl.Ref; DE 3537915; EP 251915; EP 502504; JP 01114747; WO 9005910
IC ICM G01N027-26; G01N027-327
ICS C12M001-34; C12M001-40; **C12Q001-00**
AB EP 636879 A UPAB: 19950306
A novel **biosensor** comprises: (a) an electrical insulating base; (b) an electrode system including a working electrode and a counter electrode which are provided on a face of the insulating base; and (c) a

reaction layer formed on the insulating base in close contact with the electrode system, where the reaction layer contains at least a hydrophilic polymer (HP), an enzyme and a buffer, with the enzyme being sepd. from the buffer. Also claimed are: (1) the prodn. of a **biosensor** comprising: (a) forming a 1st layer contg. an enzyme and a HP using water as the medium on a face of an insulating base in close contact with an electrode system including a working electrode and a counter electrode provided on the insulating base; and (b) forming a second layer contg. a buffer on the first layer by using an organic medium that does not dissolve the HP; (2) the prodn. of a **biosensor**, comprising: (a) forming a first layer contg. a buffer and a HP using water as the medium on a face of an insulating base in close contact with an electrode system including a working electrode and a counter electrode provided on the base; and (b) forming a second layer contg. an HP and an enzyme on the first layer by using an organic solvent as the medium that does not dissolve the HP contained in the first layer; and (3) the prodn. of a **biosensor** comprising: (i) spreading an aq. soln. contg. an HP and a buffer on an insulating base in close contact with an electrode system including a working electrode and a counter electrode provided on a face of the insulating base and drying the soln.; and (ii) spreading an organic solvent soln. contg. 1 enzyme over the layer and drying the spread soln.

USE - The **biosensor** can be used for the assay of analytes such as glucose, fructose, lactic acid, alcohol, sucrose and cholesterol.

ADVANTAGE - The buffer provides the optimum **pH** for highest enzyme activity in sample solns. By sepg. the buffer from the enzyme, the enzyme is stabilised during storage of the **biosensor**.

Dwg.0/4

FS CPI EPI
FA AB; GI; DCN
MC CPI: B04-C01; B04-C03; B11-C09; B12-K04; D05-A01A1; D05-A01B1; D05-A01C1; D05-H09; E01; E10-A07; E10-C04D4; E10-E04; E11-Q03; J04-C04
EPI: S03-E03C; S03-E14H; S05-C
ABEQ US 5658443 A UPAB: 19970926

A method for producing a **biosensor** comprising the steps of:

forming a first layer containing an enzyme and a hydrophilic polymer by using water as the medium on a face of an insulating base in close contact with an electrode system including a working electrode and a counter electrode which are provided on said insulating base; and

forming a second layer containing a buffer on said first layer by using an organic solvent solution of a lipid which does not dissolve the hydrophilic polymer.

Dwg.0/4

L108 ANSWER 19 OF 29 WPIX COPYRIGHT 2001 DERWENT INFORMATION LTD
AN 1994-350000 [44] WPIX
CR 1994-358291 [44]
DNN N1994-274616 DNC C1994-159441
TI **Bio-sensor** for detecting p-aminophenol generated in immunoassay - has an oxygen electrode, laccase and oligosaccharide dehydrogenase for **redox** amplification.
DC B04 D16 **J04** S03
IN MAKOWER, A; SCHELLER, F; WOLLENBERGER, U
PA (BYKG) BYK GULDEN ITAL SPA
CYC 1
PI DE 4314417 A1 19941110 (199444)* 3p G01N027-327
ADT DE 4314417 A1 DE 1993-4314417 19930503
PRAI DE 1993-4314417 19930503
IC ICM G01N027-327
ICS **C12Q001-32; C12Q001-42; C12Q001-54;** G01N033-53
AB DE 4314417 A UPAB: 19941223

In a **biosensor** for determn. of a p-aminophenol mediator (M) comprises: (i) laccase (I), used as an M-oxidised enzyme; and (ii) oligosaccharide dehydrogenase (ODH), used as a M-reducing enzyme (II) at an O2 electrode.

USE - The **biosensor** is used in pseudohomogeneous

immunoassays employing alkaline **phosphatase** (AP) as the label and p-aminophenylphosphate (APP) as its substrate.

ADVANTAGE - 2-enzyme electrodes contg. (I) and ODH provide a high amplification factor and are not subject to interferences. The substrates of (I) and (II), O2 and glucose, are usually present naturally in clinical samples, so extra co-substrates are not required. The **biosensor** requires only short incubation times and small sample vols.

Dwg.0/0

FS CPI EPI
FA AB; DCN
MC CPI: B04-G01; B04-L03A; B04-L03D; B07-A02A; B10-B03A; B11-C07A4; B12-K04A; D05-A02A; D05-H09; D05-H10; D05-H11; J04-B01B
EPI: S03-E03C; S03-E14H4

L108 ANSWER 20 OF 29 WPIX COPYRIGHT 2001 DERWENT INFORMATION LTD
AN 1994-064859 [08] WPIX
DNC C1994-029068
TI Determining the degree of freshness of fish - by monitoring autolytic degradation of adenosine tri-phosphate using an enzyme **bio-sensor.**
DC A89 D12 D16 **J04**
IN LUONG, J H T; MALE, K B; NGUYEN, A L
PA (CANA) NAT RES COUNCIL CANADA
CYC 1
PI US 5288613 A 19940222 (199408)* 15p C12Q001-26 <--
ADT US 5288613 A CIP of US 1988-157390 19880217, Cont of US 1990-563116 19900806, US 1991-802698 19911205
PRAI US 1988-157390 19880217; US 1990-563116 19900806; US 1991-802698 19911205
IC ICM **C12Q001-26**
ICS C12M001-40; **C12Q001-64**; G01N027-26
AB US 5288613 A UPAB: 19940407

(A) A method is claimed for determining the determining the degree of freshness of raw, frozen or processed edible fish by monitoring the autolytic degradation of adenosine triphosphate (ATP) in fish muscles to inosine monophosphate (IMP), inosine (HxR) and hypoxanthine (Hx), comprising (a) providing a homogeneous fish muscle extract in which the cell membrane of the fish muscle has been broken; (b) contacting a first portion of the extract with xanthine oxidase (XO) and nucleoside **phosphorylase** (NP) and electrochemically measuring through an **amperometric** probe, comprising an anode and a cathode, a value; d, = (HxR)+(Hx), from the simultaneous determn. of the amt. of H2O2 and uric acid resulting from the degradation of Hx and HxR in the first extract by the enzymes, where (HxR) is the HxR concn. and (Hx) is the Hx concn.; (c) contacting a second portion of the extract with nucleotidase, NP and XO and electrochemically measuring through an **amperometric** probe, comprising an anode and a cathode, a value d2 = (IMP) + (HxR) + (Hx) from the simultaneous determn. of the amt. of H2O2 and uric acid resulting from the degradation of IMP, HxR and Hx in the second extract by the enzymes; and (d) determn. the index of freshness from the formula K = d1/d2, where K represents the index of freshness.

The extract is pref. prepd. using a 10% trichloroacetic acid (TCA). Pref. the enzymes XO and NP are co-immobilised with glutaraldehyde cross-linking with BSA and deposited on a nylon 66 membrane. The nucleotidase is pref. immobilised through a glutaraldehyde activation on the wall of a polymeric tube precoated with a thin layer of polyethyleneimine.

ADVANTAGE - The immobilised enzymes provide excellent reproducible results for at least 40 repeated assays. The simultaneous determn. of both uric acid and H2O2 concns. enables accurate measurements of both values d, and d2 and thus accurate determn. of the index of freshness.

Dwg.1/10

FS CPI
FA AB; GI
MC CPI: A05-F02; A05-J07; A12-L04B; A12-W09; A12-W11L; D02-A03; D05-A01A3; D05-A01B; J04-C04

L108 ANSWER 21 OF 29 WPIX COPYRIGHT 2001 DERWENT INFORMATION LTD
AN 1993-304799 [39] WPIX
DNN N1993-234463 DNC C1993-135627
TI **Bio-sensors** having selective recognition system and shorter response times - has biochemical substance immobilised by bonding to crosslinked polysiloxane contg. epoxy gps..
DC A89 B04 D16 **J04** S03
IN FEUCHT, H; FORMANEK, H; VON, GENTZKOW W; WANNER, G
PA (SIEI) SIEMENS AG
CYC 12
PI EP 562372 A2 19930929 (199339)* DE 11p G01N027-327
R: AT CH DE FR GB IT LI NL SE
CA 2092043 A 19930924 (199350) C12M001-40
JP 06046886 A 19940222 (199412) 8p C12Q001-00 <--
US 5407818 A 19950418 (199521) 7p C12N011-08
EP 562372 A3 19940817 (199530) G01N027-327
EP 562372 B1 19971126 (199801) DE 11p G01N027-327
R: AT CH DE FR GB IT LI NL SE
DE 59307720 G 19980108 (199807) G01N027-327
JP 3151332 B2 20010403 (200121) 8p C12Q001-00 <--
ADT EP 562372 A2 EP 1993-103887 19930310; CA 2092043 A CA 1993-2092043 19930319; JP 06046886 A JP 1993-87969 19930322; US 5407818 A US 1993-35030 19930322; EP 562372 A3 EP 1993-103887 19930310; EP 562372 B1 EP 1993-103887 19930310; DE 59307720 G DE 1993-507720 19930310, EP 1993-103887 19930310; JP 3151332 B2 JP 1993-87969 19930322
FDT DE 59307720 G Based on EP 562372; JP 3151332 B2 Previous Publ. JP 06046886
PRAI DE 1992-4209367 19920323
REP No-SR.Pub; EP 291130; FR 2656423; US 4894253
IC ICM C12M001-40; C12N011-08; **C12Q001-00**; G01N027-327
ICS C08G077-04; C08G077-38; G01N027-26; G01N027-414
ICA C07K017-08
AB EP 562372 A UPAB: 19931123

Biosensors have a selective recognition system produced by: (a) depositing a film of olefinically unsatd., epoxy-functional polyether (I) on a support; (b) crosslinking (I) with high-energy radiation to form a wide-meshed epoxy-functional polymer matrix; (c) contacting the film with an aq. soln. of a biochemical substance (esp. an enzyme) so that it is immobilised by reaction with epoxy gps. in the polymer matrix; and (d) stabilising the film by reacting unconverted epoxy gps. with a cpd. contg. amino and/or COOH gps.

(I) is pref. of formula (IA), where Z = CONHR3OCOR4=CH2, COCR4=CH2, COCH=CHPh or COR3M (M = maleimido); R3 = (CH2)m with m = 1-10; R4 = H or Me; R1 = (CH2)o (o = 0-18) or CH2OR5OCH2; R5 = (CH2)p, phenylene, naphthylene, ((CH2)aO)r(CH2)q, (CH2CHMeO)sCH2CHMe, (CH2)qO(CH2)q)tOArO((CH2)qO)t(CH2)q or CH2CHMe(OCH2CHMe)tOArO(CHMeCH2O)tCHMeCH2; p = 2-20; q = 2-4; r = 1-50; s = 0-50; t = 0-25; Ar = phenylene, naphthylene, methylenediphenylene, isopropylidene-diphenylene, (CH2)3(SiMe2O)uSiMe2(CH2)3 (u = 0-150) or a gp. derived from 3,4-epoxycyclohexylmethyl 3,4-epoxycyclohexanecarboxylate; R2 = (CH2CH=CHCH2)n, R6, R6OCOR7COOR6 or (CH2)3(SiMeO)uSiMe2(CH2)3; n = 1-50; R6 = phenylene or naphthylene; R7 = (CH2)v, (CH2)q-1O((CH2)qO)s(CH2)q-1 or (CH2)q-1(O(CH2)q)tOArO((CH2)qO)t(CH2)q-1; and v = 0-20. The polymer film may be structured (e.g. by using a mask during irradiation) and/or hydrophilised after irradiation.

ADVANTAGE - A wide range of biochemical susbtances may be immobilised under mild conditons without loss of activity, using a simple method giving reproducible results. The sensors operate stably for long periods (e.g. at least 8 weeks), have short response times and are readily miniaturised.

Dwg.0/0

FS CPI EPI
FA AB; DCN
MC CPI: A05-A01C; A10-E07; A10-E18; A11-B05; A11-C02B; A12-W11L; B04-B02C; B04-C03D; B12-K04A; D05-H09; J04-C04
EPI: S03-E03C; S03-E14H5

ABEQ US 5407818 A UPAB: 19950602

Biosensors prepd. by the following method are claimed. An olefinically-unsatd. epoxy-functional polysiloxane (I) of formula R2-Si(R1)2-O-(Si(R1)2-O)x-(Si(R')(E))-O)y-(Si(R1)(Z)-O)z-Si(R1)2R2 is applied as a layer to a carrier, then (I) is cross-linked by high-energy radiation, and the resultant layer is treated with an aq. soln. of a biochemical substance (II) having gps. which react with the epoxy gps. of crosslinked (I), so that (II) is immobilised, then the layer is stabilised by reaction of any remaining epoxy gps. with a cpd. contg. an NH2 and/or CO2H gp. E is glycidyl or an epoxy gp., e.g. of formula (III) or (IV); R1 is 1-4C alkyl or **Ph**; Z is a vinyl gp. or a photopolymerisable gp.; R2 is R1, E or Z; x is 50-1000; y is 10-300; z is 3-8. (II) is an enzyme (e.g. **glucose oxidase**, catalase, **urease**, alcohol dehydrogenase, or L-asparaginase (Table 5).

USE/ADVANTAGE - For all sensor measurements. (II) have functional and long-term stability, and very short sensor response times can be achieved. Miniaturisation and integration into electronic circuits is feasible. Dwg.0/0

ABEQ EP 562372 B UPAB: 19980107

Biosensors have a selective recognition system produced by: (a) depositing a film of olefinically unsatd., epoxy-functional polyether (I) on a support; (b) crosslinking (I) with high-energy radiation to form a wide-meshed epoxy-functional polymer matrix; (c) contacting the film with an aq. soln. of a biochemical substance (esp. an enzyme) so that it is immobilised by reaction with epoxy gps. in the polymer matrix; and (d) stabilising the film by reacting unconverted epoxy gps. with a cpd. contg. amino and/or COOH gps.

(I) is pref. of formula (IA), where Z = CONHR3OCOR4=CH2, COCR4=CH2, COCH=CHPh or COR3M (M = maleimido); R3 = (CH2)m with m = 1-10; R4 = H or Me; R1 = (CH2)o (o = 0-18) or CH2OR5OCH2; R5 = (CH2)p, phenylene, naphthylene, ((CH2)aO)r(CH2)q, (CH2CHMeO)sCH2CHMe, (CH2)qO(CH2)q)tOArO((CH2)qO)t(CH2)q or CH2CHMe(OCH2CHMe)tOArO(CHMeCH2O)tCHMeCH2; p = 2-20; q = 2-4; r = 1-50; s = 0-50; t = 0-25; Ar = phenylene, naphthylene, methylenediphenylene, isopropylidene-diphenylene, (CH2)3(SiMe2O)uSiMe2(CH2)3 (u = 0-150) or a gp. derived from 3,4-epoxycyclohexylmethyl 3,4-epoxycyclohexanecarboxylate; R2 = (CH2CH=CHCH2)n, R6, R6OCOR7COOR6 or (CH2)3(SiMeO)uSiMe2(CH2)3; n = 1-50; R6 = phenylene or naphthylene; R7 = (CH2)v, (CH2)q-1O((CH2)qO)s(CH2)q-1 or (CH2)q-1(O(CH2)q)tOArO((CH2)qO)t(CH2)q-1; and v = 0-20. The polymer film may be structured (e.g. by using a mask during irradiation) and/or hydrophilised after irradiation.

ADVANTAGE - A wide range of biochemical susbtances may be immobilised under mild conditons without loss of activity, using a simple method giving reproducible results. The sensors operate stably for long periods (e.g. at least 8 weeks), have short response times and are readily miniaturised

L108 ANSWER 22 OF 29 WPIX COPYRIGHT 2001 DERWENT INFORMATION LTD
AN 1993-127644 [16] WPIX
CR 1996-435774 [44]
DNN N1993-097416 DNC C1993-056681
TI **Bio-sensor** for determining enzyme substrate - has **electrode** system covered by enzyme contg. layer and **reference electrode** system.
DC A89 B04 D16 **J04** S03
IN NANKAI, S; YOSHIOKA, T
PA (MATU) MATSUSHITA ELECTRIC IND CO LTD; (MATU) MATSUSHITA ELEC IND CO LTD; (MATU) MATSUSHITA ELECTRONICS CORP
CYC 5
PI EP 537761 A2 19930421 (199316)* EN 26p C12M001-40
R: DE FR GB
JP 05196596 A 19930806 (199336) 7p G01N027-327
US 5264103 A 19931123 (199348) 14p G01N027-26
JP 05340915 A 19931224 (199405) 7p G01N027-327
EP 537761 A3 19940202 (199518) C12M001-40
EP 537761 B1 19970827 (199739) EN 28p C12M001-40

R: DE FR GB
JP 2658769 B2 19970930 (199744) 7p G01N027-327
DE 69221808 E 19971002 (199745) C12M001-40
JP 2960265 B2 19991006 (199947) 7p G01N027-327

ADT EP 537761 A2 EP 1992-117711 19921016; JP 05196596 A JP 1992-282844 19921021; US 5264103 A US 1992-961528 19921015; JP 05340915 A JP 1992-278390 19921016; EP 537761 A3 EP 1992-117711 19921016; EP 537761 B1 EP 1992-117711 19921016, Related to EP 1996-108449 19921016; JP 2658769 B2 JP 1992-282844 19921021; DE 69221808 E DE 1992-621808 19921016, EP 1992-117711 19921016; JP 2960265 B2 JP 1992-278390 19921016

FDT EP 537761 B1 Related to EP 735363; JP 2658769 B2 Previous Publ. JP 05196596; DE 69221808 E Based on EP 537761; JP 2960265 B2 Previous Publ. JP 05340915

PRAI JP 1992-88507 19920409; JP 1991-270839 19911018; JP 1991-272293 19911021

REP No-SR.Pub; EP 127958; EP 359831; EP 502504

IC ICM C12M001-40; G01N027-26; G01N027-327
ICS **C12Q001-26**; G01N027-28; G01N027-416

AB EP 537761 A UPAB: 19991122

Biosensor comprises an electrically insulating substrate, a main **electrode** system (working and counter **electrodes**) formed on the substrate; reaction layer in contact with (or near) this **electrode** system and contg. an **oxidoreductase** (I); and a sub-**electrode** system (working and counter **electrodes**) serving as **reference** and spaced apart from the main **electrode** system.

The reaction layer may also include electron acceptors (II) and a hydrophilic polymer (III), and a similar layer but without (I) is placed over the sub-**electrode** system. Opt. the **biosensor** may carry several different **electrode** systems (on different substrate surfaces).

USE/ADVANTAGE - These sensors measure accurately and quickly a specific cpd. (substrate for (I)). No pretreatment is needed to remove interfering reducing components and constant sensor response is achieved whatever the sample viscosity. Typical applications include measurement of glucose in blood and fruit juice.

Dwg.2/14

FS CPI EPI

FA AB; GI; DCN

MC CPI: A12-E13; B04-B02C2; B04-B04A6; B04-B04D5; B04-C02A2; B04-C02B2; B04-C03; B05-A03A; B06-D14; B10-A06; B10-A07; B11-C08B; B12-K04A; D03-K03; D05-A01B1; D05-H09; **J04-B01**
EPI: S03-E03C; S03-E14H

ABEQ US 5264103 A UPAB: 19940120

A **biosensor** comprises an electrically insulating substrate (1) on which a working (6) and a counter (7) **electrode** are formed. A reaction layer (5) in contact with or adjacent to the **electrode** system contains an **oxidoreductase**, and there is a **ref.** **electrode** system with working (8) and counter (9) **electrodes** and a layer (5) contg. electron acceptors and a hydrophilic polymer on it.

The polymer is pref. carboxymethylcellulose, hydroxyethylcellulose, hydrooxypropylcellulose, methylcellulose, ethylcellulose, carboxymethylethyl-cellulose, polyvinylpyrrolidone, polyvinylalcohol, gelatin, poly(meth)acrylic acid or its salts, starch, or polymaleic acid or its salts. The enzyme is pref. fructose or lactase dehydrogenase, or glucose, alcohol, lactase, cholesterol, xanthine or aminoacid oxidase.

ADVANTAGE - Permits rapid and accurate measurements.

Dwg.3/14

ABEQ EP 537761 B UPAB: 19970926

A **biosensor** comprising an electrical insulating substrate (1), a main **electrode** system (19) formed on the substrate (1) and having a working **electrode** (6) and a counter **electrode** (7), a reaction layer (5) provided in contact with or in the vicinity of the main **electrode** system (19) and containing an **oxidoreductase**, and a sub **electrode** system (20) as a

reference provided with an interval from the main **electrode** system (19) and having a working **electrode** (8) and a counter **electrode** (9).
Dwg.2/14

L108 ANSWER 23 OF 29 WPIX COPYRIGHT 2001 DERWENT INFORMATION LTD
AN 1993-059601 [08] WPIX
DNN N1993-045470 DNC C1993-026663
TI Immuno-**sensor** for sensitive detection of low mol. wt. antigen - uses displacement of enzyme conjugate, reaction with substrate and prod. amplification on **bio-sensor**, used esp. for drugs, herbicides and explosives.
DC B04 C07 D16 **J04** K04 S03
IN HINTSCHE, R; RENNEBERG, R; SCHELLER, F; SCHUBERT, F; WOLLENBERGER, U
PA (MOLE-N) ZENT INST MOLEKULARBIOLOGIE; (BSTB-N) BST BIO SENSOR TECHNOLOGIE GMBH
CYC 1
PI DE 4126692 A1 19930218 (199308)* 4p G01N033-535
DE 4126692 C2 19950511 (199523) 4p G01N033-535
ADT DE 4126692 A1 DE 1991-4126692 19910813; DE 4126692 C2 DE 1991-4126692 19910813
PRAI DE 1991-4126692 19910813
IC ICM G01N033-535
ICS **C12Q001-26; C12Q001-32; C12Q001-42; C12Q001-44; C12Q001-48; C12Q001-527**
AB DE 4126692 A UPAB: 19931119
Immunosensor device for detecting antigens (**Ag**) of mol. wt. below 2000 comprises 1 or 2 enzyme-immunoreactors (IR) and a **biosensor** coated with at least one **biocatalyst**. The measurement soln., which contains a substrate S for the enzyme conjugate used in IR and opt. co-substrates for **biocatalyst**, flows from the IR to the **biosensor**.

Also new is a method using this device. The sample is added to IR contg. an immobilised **Ag**-specific antibody (Ab) which, before measurement, is satd. with an enzyme-configurate (EC) of **Ag**. **Ag** in the sample displaces EC and opt. this is bound in a second IR or by Ab on the **biosensor** surface. After leaving the first IR, the sample is mixed with S and the resulting product amplifies by the **biosensor**.

USE/ADVANTAGE - The method is used to detect drugs, herbicides and explosives. Coupling of IR with a **biosensor** amplifies the detection signal and so increases sensitivity. The method is used e.g. to detect traces of **Ag** in the air. The increase in sensitivity is 10-20 times using one enzyme or 100-1000 times using two enzymes, so incubation time can also be reduced
Dwg.0/0
FS CPI EPI
FA AB; DCN
MC EPI: S03-E14H4
ABEQ DE 4126692 C UPAB: 19950619
Immune sensor device for measuring antigens of less than 2000 Daltons comprises a) one or two enzyme immunoreactors (I) laden with enzyme conjugates of the analytes with pyruvate kinase, oxalacetatedecarboxylase, **phosphatase** or aryl sulphatase; b) a **biosensor** contg. lactate oxidase and lactate dihydrogenase, cytochrome b2 and lactate dehydrogenase or laccase in an enzyme layer; and c) a measuring soln., with the substrate phosphoenolpyruvate, oxalacetate or pyrocatechol for the enzyme conjguate present. The soln. flows from the immune reactor the the **biosensor**.

USE - The device is used for measuring herbicides, explosives or narcotics.
Dwg.0/0

L108 ANSWER 24 OF 29 WPIX COPYRIGHT 2001 DERWENT INFORMATION LTD
AN 1992-388264 [47] WPIX
DNC C1992-172485

TI **Bio-sensor** for glucose and fructose - by forming immobilised whole cell enzyme membrane contg. Zymomonas mobilis cells and bonding to surface of **pH** electrode.
DC A89 D16 D17 E13 **J04**
IN KIM, H; PARK, J
PA (KOAD) KOREA ADV INST SCI & TECHN
CYC 2
PI KR 9107824 B 19911002 (199247)* C12Q001-26 <--
US 5177012 A 19930105 (199304)B 3p C12N011-18
ADT KR 9107824 B KR 1989-15344 19891025; US 5177012 A US 1990-572254 19900827
PRAI KR 1989-15344 19891025
IC ICM C12N011-18; **C12Q001-26**
ICS C12M001-40; C12N011-02
AB KR 9107824 B UPAB: 19931116
A method for manufacturing **biosensor** comprise: (a) mixing Zymomonas mobilis cell contg. glucose-fructose **oxidoreductase** and gluconolactonase with organic solvent, e.g., xylene or n-butanol for 10 min. and centrifuging to obtain the whole cell enzyme (I); (b) immobilising the obtd. (I) with gelatin, colagen, agalose, cellophane or polyacrylamine to obtain the immobilised whole cell enzyme membrane (II); (c) cutting and (II) and sticking to the surface of **pH** electrode by using nylon net and silicon O-ring (diameter is 10 mm) to obtain the **biosensor** (III). The (III) is useful for measuring high density of glucose and fructose
FS CPI
FA AB; DCN
MC CPI: A12-E14; A12-L04; A12-W11L; D05-A03A; D05-H09; D06-G; E10-A07; J04-C04

L108 ANSWER 25 OF 29 WPIX COPYRIGHT 2001 DERWENT INFORMATION LTD
AN 1992-382499 [47] WPIX
CR 1993-377436 [47]
DNN N1992-291710 DNC C1992-169712
TI Improved interferant eliminating electrochemical **bio sensor** - comprises electrode, sensing surface contg. oxido reductase in electrical contact with electrode, and interferant eliminating surface contg. catalyst.
DC B04 D16 **J04** S03
IN HELLER, A; MAIDAN, R
PA (HELL-I) HELLER A; (HELL-N) HELLER & CO E
CYC 3
PI CA 2050057 A 19920905 (199247)* 26p C12Q001-26 <--
JP 04278450 A 19921005 (199247) G01N027-327
US 5356786 A 19941018 (199441) 9p C12Q001-54 <--
ADT CA 2050057 A CA 1991-2050057 19910827; JP 04278450 A JP 1991-238928 19910827; US 5356786 A Cont of US 1991-664054 19910304, US 1993-161682 19931202
PRAI US 1991-664054 19910304; US 1993-161682 19931202
IC ICM **C12Q001-26**; **C12Q001-54**; G01N027-327
ICS C07C001-00; C12M001-40; **C12Q001-00**; **C12Q001-28**
AB CA 2050057 A UPAB: 19971006
Biosensor, comprises (a) an electrode; (b) a sensing surface, contg. an **oxidoreductase** in electrical contact with (a); and (c) an interferant eliminating surface, contg. a catalyst-capable of catalysing the oxidn. of several interferants in the presence of an oxidant, not in electrical contact with (a).

A specific example of use is for the assay of glucose in blood, in which interferants can comprise ascorbate, urate, bilirubin, cysteine, and acetaminophenol; other examples include the determination of lactate, cholesterol, alcohol, or urate. Samples may be for clinical analysis ex vivo, or be from industrial fermenters or reactor processes. The appts. can opt. be made disposable for convenience.

The assay procedure (claimed) is simple, and comprises: (i) adding an oxidant to the sample; (ii) immersing the sensor into the sample so that interferants are substantially oxidised by the surface (c); and (iii) detecting the analyte at the sensing surface.

USE/ADVANTAGE - The appts. is an improved sensor for assay of the concn. of an analyte in soln. Interferants are selectively oxidised before they can interfere substantially with the assay by the catalyst layer (c), improving accuracy. As the catalyst layer itself may affect the assay, it is prevented from contact with the sensor. The system may be used with all the different kinds of electrochemical sensing methods; **amperometric**, potentiometric, conductimetric or impedimetric, and immunoelectrodes can benefit from elimination of interferants.
ce.
Dwg.3/6

FS CPI EPI
FA AB; GI; DCN
MC CPI: B04-B02C2; B04-B04D5; B04-D02; B05-C06; B10-A07; B11-C08B; B12-K04A; B12-K04E; D05-A01B1; D05-H09; **J04-B01**; J04-C04
EPI: S03-E03C; S03-E14H
ABEQ US 5356786 A UPAB: 19941206

Biosensor comprises an anode coated with analyte sensing layer (e.g. contg. glucoseoxidase, lactateoxidase, etc) and an immobilised, insulated layer contg. a catalyst which in presence of H2O2 brings about previous oxidn. of contaminants which interfere with subsequent anodic oxidative determination of a substrate (e.g. glucose, lactate, etc.).

USE/ADVANTAGE - Prod. is an improved **biosensor** for the rapid **amperometric** determn. of enzyme substrates, eliminating interference effects, for fast clinical analysis and diagnosis. Catalysts layer causes oxidn. of interfering contaminants before the **amperometric** determn. of a given enzyme substrate.
Dwg.6/6

L108 ANSWER 26 OF 29 WPIX COPYRIGHT 2001 DERWENT INFORMATION LTD
AN 1991-326496 [45] WPIX
DNN N1991-250060 DNC C1991-141027
TI **Bio-sensor** for **amperometric** measurements - comprises upper layer contg. apertures contg. **electrodes** and biological component attached to 2nd layer and conductor.
DC B04 D16 **J04** S03
IN BILITEWSKI, U; RUGER, P; RUEGER, P
PA (GBFB) GBF GES BIOTECH FORSCH; (GBFB) GBF GES BIOTECH FORSCHUNG GMBH
CYC 1
PI DE 4013593 A 19911031 (199145)*
DE 4013593 C2 19930624 (199325) 10p G01N027-49
ADT DE 4013593 A DE 1990-4013593 19900427; DE 4013593 C2 DE 1990-4013593 19900427
PRAI DE 1990-4013593 19900427
IC C07D241-96; C12N011-14; **C12Q001-32**; G01N027-49; H01L049-00
ICM G01N027-49
ICS C07D241-46; C07D241-96; C12N011-14; **C12Q001-32**; G01N027-333; G01N027-414; H01L049-00
AB DE 4013593 A UPAB: 19930928

Process for **amperometric** measurement uses thick layer **biosensors** (1) in which the uppermost layer (2) has apertures (3) each contg. partial **electrode** (4) on one side and the biological component (5) on the other. The upper layer is placed on the second layer (2) which is attached to the partial **electrodes** and to the conductor (7) to which the **electrodes** are attached. Both conductor and **electrodes** contain noble metals.

USE/ADVANTAGE - Enables dehydrogenases to be used as the biological component, thus broadening the scope of **amperometric** measurements previously used with oxidases. There are several apertures so **reference electrode** and auxiliary **electrode**(s) can be built in thus combining all the **electrodes** necessary on one substrate. Another aperture can be filled with **electrode** material (e.g. a carbon paste) modified with the biological component to form the working **electrode**. @(10pp Dwg.No.1/5)@

FS CPI EPI
FA AB; GI
MC CPI: B04-B02C2; B05-A03B; B05-C06; B11-C08B; B12-K04E; D05-A01B1;

D05-A01C1; D05-H09; **J04-B01**; J04-C04
EPI: S03-E03B1; S03-E03C
ABEQ DE 4013593 C UPAB: 19931116
A thick-layer **biosensor** for **amperometric** determn. of enzyme substrates comprises a multilayer substrate with gaps (3) in the upper layer (2) filled with a substance acting as a membrane for the substance to be measured. The substrate comprises a series of layers on top of one another, with pathways (7). The layers (2,6) are of ceramic; the membrane (5) is made of modified carbon paste; and the **electrodes** (4,7) are made of **gold** paste.
Pref. the membrane (5) is made of oil and graphite powder mixed with enzymes, cofactors and/or mediators, e.g. dehydrogenase and NAD/NADH or **glucose oxidase** and mediators, with the enzyme pref. modified.
USE/ADVANTAGE - Broadens the scope of **biosensors**, e.g. for measuring H2O2 or O2.
Dwg.1/5

L108 ANSWER 27 OF 29 WPIX COPYRIGHT 2001 DERWENT INFORMATION LTD
AN **1991-208165** [28] WPIX
CR 1994-064865 [08]; 1996-208716 [21]; 1997-109068 [10]
DNC **C1991-090327**
TI **Amperometric bio-sensor** esp. for assaying glucose in body fluids - having working and counter electrodes of same material coated with reagent contg. enzyme, **redox** mediator and buffer.
DC A89 B04 D16 **J04**
IN BATESON, J E; GERBER, M T; HAN, C A; KOST, K M; KUHN, L S; OCHS, M L; POLLMANN, K H; WALLING, P D; GERBERT, M T; HAN, C; OCHS, M
PA (BOEF) BOEHRINGER MANNHEIM CORP; (HOFF) ROCHE DIAGNOSTICS CORP
CYC 18
PI WO 9109139 A 19910627 (199128)* 53p
RW: AT BE CH DE DK ES FR GB GR IT LU NL SE
W: AU CA JP KR
AU 9171716 A 19910718 (199142)
EP 505494 A1 19920930 (199240) EN 53p C12Q001-54 <--
R: AT BE CH DE DK ES FR GB GR IT LI LU NL SE
AU 634863 B 19930304 (199316) C12Q001-26 <--
JP 05505459 W 19930812 (199337) 18p G01N027-327
EP 505494 A4 19931006 (199527)
EP 505494 B1 19950712 (199532) EN 24p C12M001-40
R: AT BE CH DE DK ES FR GB GR IT LI LU NL SE
DE 69020908 E 19950817 (199538) C12M001-40
ES 2075955 T3 19951016 (199547) C12M001-40
CA 2069946 C 19990126 (199915) C12Q001-54 <--
KR 171222 B1 19990218 (200040) C12Q001-54 <--
JP 3171444 B2 20010528 (200132) 15p G01N027-327
ADT EP 505494 A1 WO 1990-US7374 19901214, EP 1991-902586 19901214; AU 634863 B AU 1991-71716 19901214; JP 05505459 W WO 1990-US7374 19901214, JP 1991-502803 19901214; EP 505494 A4 EP 1991-902586 ; EP 505494 B1 WO 1990-US7374 19901214, EP 1991-902586 19901214; DE 69020908 E DE 1990-620908 19901214, WO 1990-US7374 19901214, EP 1991-902586 19901214; ES 2075955 T3 EP 1991-902586 19901214; CA 2069946 C CA 1990-2069946 19901214; KR 171222 B1 WO 1990-US7374 19901214, KR 1992-701436 19920615; JP 3171444 B2 WO 1990-US7374 19901214, JP 1991-502803 19901214
FDT EP 505494 A1 Based on WO 9109139; AU 634863 B Previous Publ. AU 9171716, Based on WO 9109139; JP 05505459 W Based on WO 9109139; EP 505494 B1 Based on WO 9109139; DE 69020908 E Based on EP 505494, Based on WO 9109139; ES 2075955 T3 Based on EP 505494; JP 3171444 B2 Previous Publ. JP 05505459, Based on WO 9109139
PRAI US 1989-451671 19891215
REP US 4224125; US 4758323; US 4830959; US 4959305; EP 230472; EP 230786; EP 255291; WO 8607632; WO 8908713
IC ICM C12M001-40; **C12Q001-26**; **C12Q001-54**; G01N027-327
ICS C12M001-00; C12M001-34; C12M001-36; C12N009-04; **C12Q001-00**; G01N027-28; G01N027-416

AB WO 9109139 A UPAB: 20010611
Analytical device comprises: (1) first electrically insulating support carrying working (WE) and counter (CE) electrodes, made of the same material and of the same size; (2) second electrically insulating support overlying the first and having cut out portions exposing equal surface areas of both electrodes; and (3) reagent, covering the exposed electrode portions, consisting of oxidised form of a **redox** mediator (ORM), enzyme (E) and buffer.

ORM can receive at least one electrode from a reaction involving E, analyte (I) and ORM, and is present in an amt. which ensures that the current produced by diffusion-limited electro-oxidn. is limited by oxidn. of the reduced from of **redox** mediator (TRM) at the surface of WE. The buffer has a higher oxidn. potential than TRM and provides a suitable **pH** for the enzymatic reaction.

USE/ADVANTAGE - These **amperometric biosensors** are used to assay e.g. glucose or cholesterol in body fluids, fermentation prods. etc. Provided the current prodn. is limited by oxidn. (redn). of RM, then only 2 electrodes of the same material are used which facilitates prodn. (contrast known sensors which use 3 electrodes and/or different electrode materials).

Dwg.0/3

FS CPI

FA AB; DCN

MC CPI: A12-L04; A12-V03C2; B01-D02; B04-B02C2; B04-B04D5; B04-C02; B04-C03; B05-A03; B05-B02A3; B05-C03; B05-C06; B07-A02; B10-A07; B10-B02B; B10-B02E; B11-C08B; B12-K04A; D05-C; D05-H09; **J04-B01**

ABEQ JP 05505459 W UPAB: 19931123
Analytical device comprises: (1) first electrically insulating support carrying working (WE) and counter (CE) electrodes, made of the same material and of the same size; (2) second electrically insulating support overlying the first and having cut-out portions exposing equal surface areas of both electrodes; and (3) reagent, covering the exposed electrode portions, consisting of oxidised form of a **redox** mediator (ORM), enzyme (E) and buffer.

ORM can receive at least one electrode from a reaction involving E.analyte (I) and ORM, and is present in an amt. which ensures that the current produced by diffusion-limited electro-oxidn. is limited by oxidn. of the reduced from of **redox** mediator (TRM) at the surface of WE. The buffer has a higher oxidn. potential than TRM and provides a suitable **pH** for the enzymatic reaction.

USE/ADVANTAGE - These **amperometric biosensors** are used to assay e.g. glucose or cholesterol in body fluids, fermentation prods. etc. Provided the current prodn. is limited by oxidn. (redn.) of RM, then only 2 electrodes of the same material are used which facilitates different electrode materials).

ABEQ EP 505494 B UPAB: 19950818
A device for analysing an analyte comprising: (a) a first electrical insulator; (b) a pair of electrodes consisting of working and counter electrodes of substantially the same sizes or of a working electrode and a counter electrode that is smaller than the working electrode, the electrodes being made of the same electrically conducting materials and being supported on the first electrical insulator; (c) a second electrical insulator, overlaying the first electrical insulator and the electrodes and including a cutout portion that exposes substantially equal surface areas of the working and counter electrodes or a smaller surface area of the counter electrode than the working electrode; and (d) a reagent, substantially covering the exposed electrode surfaces in the cutout porton and comprising the (a) oxidised or (b) reduced form of a **redox** mediator, an enzyme, and a buffer, the (a) oxidised or (b) reduced form of the **redox** mediator being of sufficient type (a) to receive or (b) to donate at least one electron from a reaction involving enzyme, analyte, and (a) oxidised or (b) reduced form of the **redox** mediator and being in sufficient amount to insure that current produced by diffusion limited (a) electrooxidation or (b) electroreduction is limited by (a) the oxidation of the reduced form or (b) the reduction of the oxidised form of the **redox** mediator at the working electrode

surface, the enzyme being of sufficient type and in sufficient amount to catalyse the reaction involving enzyme, analyte and (a) oxidised or (b) reduced form of the **redox** mediator, and the buffer having (a) a higher oxidation potential than the reduced form of the **redox** mediator or (b) having a lower reduction potential than the oxidised form of the **redox** mediator and being of sufficient type and in sufficient amount to provide and maintain a **pH** at which the enzyme catalyses the reaction involving enzyme, analyte and (a) oxidised or (b) reduced form of the **redox** mediator.
Dwg.0/3

L108 ANSWER 28 OF 29 WPIX COPYRIGHT 2001 DERWENT INFORMATION LTD
AN **1990-277041** [37] WPIX
DNN **N1990-214091** DNC **C1990-119680**
TI **Bio-sensor** device - has **electrode** pairs, one incorporating **bio catalyst**, supported on electrical insulator on silicon substrate.
DC B04 D16 **J04** S03 S05
IN LOWE, C R; SETHI, R S; YONHIN, F Y Y
PA (PLES) PLESSEY OVERSEAS LTD
CYC 6
PI EP 387026 A 19900912 (199037)*
R: DE FR IT NL
GB 2229005 A 19900912 (199037)
JP 03017547 A 19910125 (199110)
EP 387026 A3 19920415 (199328)
ADT EP 387026 A EP 1990-302417 19900307; GB 2229005 A GB 1989-5507 19890310; JP 03017547 A JP 1990-59818 19900309; EP 387026 A3 EP 1990-302417 19900307
PRAI GB 1989-5507 19890310
REP NoSR.Pub; 5.Jnl.Ref; EP 367432; GB 2204408
IC C12M001-40; **C12Q001-54**; G01N027-32; G01N033-54
AB EP 387026 A UPAB: 19931116
A **biosensor** device is claimed comprising 2 spaced pairs of **electrodes** supported on a surface of electrical insulation material on a silicon substrate, one of the **electrode** pairs including a body of an immobilised reagent material incorporating an active biological catalyst, the body being positioned between the **electrodes** of the pair to constitute a working **electrode** structure. The support surface may also carry a third **electrode** pair to constitute a **reference electrode** structure.
the **electrodes** may be formed of a noble metal such as **gold** or **platinum**.
USE/ADVANTAGE - The **reference electrode** can be built on a common chip with the working **electrode**(s), enabling the voltage differential needed for the detection process to be kept at a low value, e.g. 0.7V for sensing glucose and galactose. This reduces possible electrical interference which will facilitate analysis for a single component in a mixt. @(11pp Dwg.No.1/5)@
1/5
FS CPI EPI
FA AB; GI; DCN
MC CPI: B04-B02C2; B05-A03B; B05-B02C; B10-A07; B11-C08B; B12-K04; D05-A01A5; D05-A01B1; D05-H09; **J04-B01**
EPI: S03-E03C; S03-E14A; S03-E14H; S05-C

L108 ANSWER 29 OF 29 WPIX COPYRIGHT 2001 DERWENT INFORMATION LTD
AN **1989-043860** [06] WPIX
DNN **N1989-033484** DNC **C1989-019274**
TI **Bio sensor** used in clinical diagnosis - comprises measuring electrode and opposing electrode on insulating support carrying **redox** enzyme, antibody, antigen etc..
DC B04 D13 D16 **J04**
PA (MATU) MATSUSHITA ELEC IND CO LTD
CYC 1
PI JP 63317097 A 19881226 (198906)* 6p
ADT JP 63317097 A JP 1987-153667 19870619

PRAI JP 1987-153667 19870619
IC **C12Q001-00**
AB JP 63317097 A UPAB: 19930923
At least two measuring electrodes each having the same shape and an opposite electrode which is common to the measuring electrodes, are provided on an insulating support. A carrier carrying at least one of **redox** enzyme, antibody, antigen and electron acceptor which are necessary for determg. a sample soln., is placed over the support; and the support and the carrier are integrated together to form a **biosensor**. Using the **biosensor**, the concn. of the substance contained in the sample soln. to be determd. is electrochemically determd. with the said measuring electrodes in order or simultaneously, and the data obtd. is displayed after data processing.
USE/ADVANTAGE - Partic. components in a living sample can selectively, highly accurately, rapidly and easily determo. by quantitative means. The **biosensor** is widely usable in clinical diagnosis or food industry.
0/6
FS CPI
FA AB; DCN
MC CPI: B04-B02C2; B04-B04C2; B04-B04C6; B11-C08B; B12-K04A; D03-K03; D03-K04; D05-A01A; D05-A01B1; D05-H09; D05-H10; **J04-B01**

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FILE 'HCAPLUS' ENTERED AT 09:53:26 ON 19 DEC 2001
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L1 1 S E3,E4
E SAICOM/PA,CS
L2 3 S E3-E6
E PIZZARIELLO A/AU
L3 11 S E3,E4
E STREDANSKY M/AU
L4 24 S E2-E4
E STREDANSK /AU
L5 8 S E4,E5
E MIERTUS S/AU
L6 170 S E3-E7
E BIOSENSOR/CT
E E4+ALL
L7 8602 S E7+NT
L8 11090 S E7,E11,E12,E13/BI
L9 80 S BIO SENSOR
L10 602 S BIO(L)SENSOR
E BIOSENSOR/CT
L11 416 S E5
L12 11465 S L7-L11
E ENZYME/CT
E ELECTRODE/CT
E ELECTRODES/CT
E E3+ALL
L13 2970 S L12 AND E3+NT
L14 3972 S L12 AND ELECTRODE
L15 4050 S L13,L14
L16 2577 S L15 AND ENZYM?
E ENZYMES/CT
L17 527 S L15 AND E3
L18 160 S (ENZYME#(L)USE#)/CW AND L15
L19 2577 S L16,L17,L18

FILE 'REGISTRY' ENTERED AT 10:09:09 ON 19 DEC 2001
L20 16 S 9000-95-7 OR 9001-03-0 OR 9001-37-0 OR 9002-13-5 OR 9013-05-2

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     FILE 'HCAPLUS' ENTERED AT 10:13:30 ON 19 DEC 2001
L21         1029 S L20 AND L15
L22         1281 S L15 AND (OXALACETATE DECARBOXYLASE OR HYDROLASE OR OXIDOREDUC
L23         2734 S L19,L21,L22
L24          718 S L15 AND (SYNZYM? OR CELL# OR TISSUE# OR NUCLEIC ACID# OR IMMU
L25         3080 S L23,L24
L26          156 S L15 AND (BIOCATALY? OR BIO CATALY?)
L27         3092 S L25,L26

     FILE 'REGISTRY' ENTERED AT 10:40:02 ON 19 DEC 2001
L28            7 S 517-28-2 OR 475-25-2 OR 61-73-4 OR 117-39-5 OR 149-91-7 OR 95

     FILE 'HCAPLUS' ENTERED AT 10:40:38 ON 19 DEC 2001
L29           31 S L28 AND L27
L30           80 S L27 AND (HEMATOXYLIN# OR HEMATEIN# OR METHYLENE BLUE OR QUERC
L31          377 S L27 AND REDOX
L32          448 S L29,L30,L31

     FILE 'REGISTRY' ENTERED AT 10:43:04 ON 19 DEC 2001
L33            8 S (PLATINUM OR GOLD OR MERCURY OR GLASSY CARBON OR CALOMEL OR S

     FILE 'HCAPLUS' ENTERED AT 10:44:47 ON 19 DEC 2001
L34          156 S (PLATINUM OR GOLD OR MERCURY OR GLASSY CARBON OR CALOMEL OR S
L35          104 S (PT OR AU OR HG OR HG2CL2 OR AGCL OR AG) AND L32
L36          111 S L33 AND L32
L37          220 S L34-L36
L38           43 S L37 AND PH#
L39           32 S L38 AND (BIOCHEM?(L)METHOD?)/SC,SX
L40            9 S L38 AND ENZYM?/SC,SX
L41           36 S L39,L40
L42           28 S L2-L6 AND L12
L43           21 S L42 AND L15
L44           19 S L43 AND L23
L45           24 S L38 AND AMPEROMET?
L46           20 S L45 AND L41
L47            4 S L45 NOT L46
L48            1 S L47 AND GLUTAMATE OXIDASE
L49            3 S L46 AND PH# SENS?
L50           17 S L46 NOT L48,L49
L51           10 S L50 AND 9/SC
L52            7 S L50 NOT L51
L53           17 S L51,L52
L54            3 S L38,L41,L53 AND L42
L55           25 S L42 NOT L54
L56           25 S L2-L6 AND L55
                 SEL DN 13-24
L57           13 S L56 NOT E1-E12
L58           34 S L48,L49,L51,L52,L53,L54,L57
L59           22 S L38 NOT L58
                 SEL DN 8 16
L60            2 S L59 AND E13,E14
L61           14 S L41 NOT L58,L60
L62            7 S L61 NOT (PHENOTHIAZINE OR GREEN OR THIONINE OR ANALOGS OR TRA
L63           43 S L58,L60,L62
                 SEL HIT RN

     FILE 'REGISTRY' ENTERED AT 11:12:53 ON 19 DEC 2001
L64           30 S E15-E44

     FILE 'HCAPLUS' ENTERED AT 11:12:59 ON 19 DEC 2001
L65           32 S L2-L6 AND ?SENSOR?
L66           16 S L65,L42 NOT L63
                 SEL DN 5-16
L67           20 S L65 NOT E45-E56
                 E STRED ANSK/AU
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L68          11 S E4-E7
L69           5 S L68 AND L12
L70           6 S L68 AND ?SENSOR?
L71          47 S L69,L70,L63,L67
L72           5 S L68 NOT L71
L73          12 S L66 NOT L71
L74          11 S L73 NOT 115:90773/DN
L75          58 S L71,L74

     FILE 'HCAPLUS' ENTERED AT 11:18:42 ON 19 DEC 2001

     FILE 'WPIX' ENTERED AT 11:19:09 ON 19 DEC 2001
                E WO2000-EP455/AP,PRN
L76           1 S E3
                E MIERTUS S/AU
L77           3 S E3
                E PIZZARIELLO A/AU
L78           5 S E3,E1
                E STREDANSK/AU
L79           5 S E4-E6
                E STRED/AU
L80           8 S L76-L79
L81        1721 S BIOSENSOR OR BIO SENSOR
L82           3 S L80 AND L81
L83           3 S L80 AND ?SENSOR?
L84           3 S L82,L83
L85         417 S L81 AND C12Q001/IC,ICM,ICS
L86         542 S L81 AND J04-B01/MC
L87        1044 S L81 AND J04/DC
L88         140 S L85 AND L86
L89         275 S L85 AND L87
L90         277 S L88,L89
L91           3 S L76,L84
L92           7 S L90 AND (BIOCATAL? OR BIO CATAL?)
L93          34 S L90 AND PH
L94          28 S L90 AND AMPEROMET?
L95          23 S L90 AND REDOX
L96         136 S L90 AND ELECTRODE
L97          25 S L96 AND REFER?(S)ELECTRODE
L98          93 S L92-L95,L97
L99          28 S L98 AND (OXALACETATE DECARBOXYLASE OR HYDROLASE OR OXIDOREDUC
L100         30 S L91,L99
L101         25 S L100 AND (BIOSENSOR OR BIO SENSOR OR SENSOR)/TI
L102         20 S L101 NOT (IMPLANTABLE OR PVP OR FOIL OR BUFFER OR PYRROLE)/TI
L103         69 S L98 NOT L101
               SEL DN AN L103 14 17 29 33 35 37 54 60 64
L104          9 S L103 AND E1-E23
L105         29 S L102,L104,L91
L106          8 S L105 AND (PLATINUM OR GOLD OR MERCURY OR GLASSY CARBON OR SIL
L107          1 S L105 AND (HEMATOXYLIN? OR HEMATEIN# OR METHYLENE BLUE OR QUER
L108         29 S L105-L107

     FILE 'WPIX' ENTERED AT 11:38:54 ON 19 DEC 2001
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